

# INFO 64

ISSUE #6 \$2.95 U.S.  
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- ▶ CES REPORT
- ▶ 3 HARD-DRIVES
- ▶ TELECOMPUTING - '85

## REVIEWS

- COMAL 2.01
- THE WORD PROCESSOR
- the PRINT SHOP
- AEROBICS
- BEARCAT 2100 Scanner
- TELENGARD
- ADVENTURE CREATOR
- POWER 64
- More...More...More...



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LCD

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- ▶ Assembly Language Tutorial
- ▶ Making Money with your 64
- ▶ Whither CP/M ?
- ▶ Gallery / 3 new ERG-CARDS



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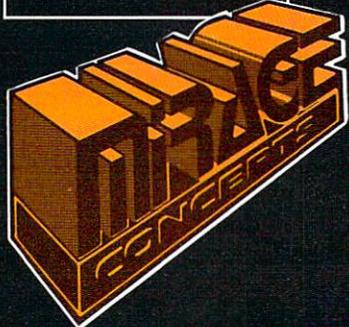


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## FONTS & GRAPHICS:

*Flexidraw™*  
INKWELL SYSTEMS

## DIGITIZED PHOTOS

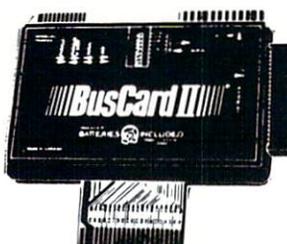
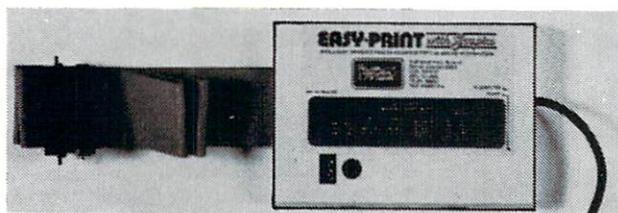
COMPUTEREYES™  
by:

## DIGITAL VISION

## WORDPROCESSING:

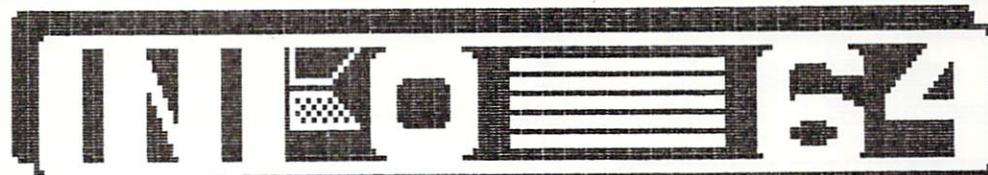


## DISK DRIVES INTERFACES



## PRINTERS:

STAR MICRONICS RADIX 15  
C. ITOH 8510  
BROTHER HR-35



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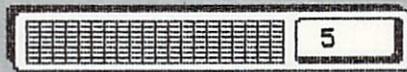
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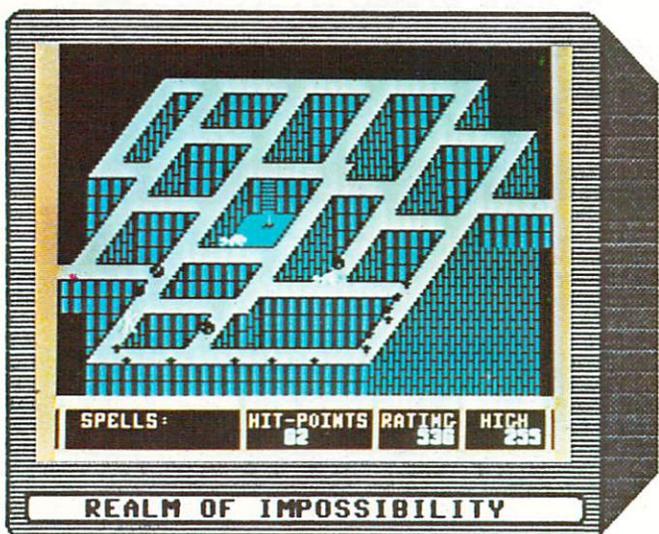
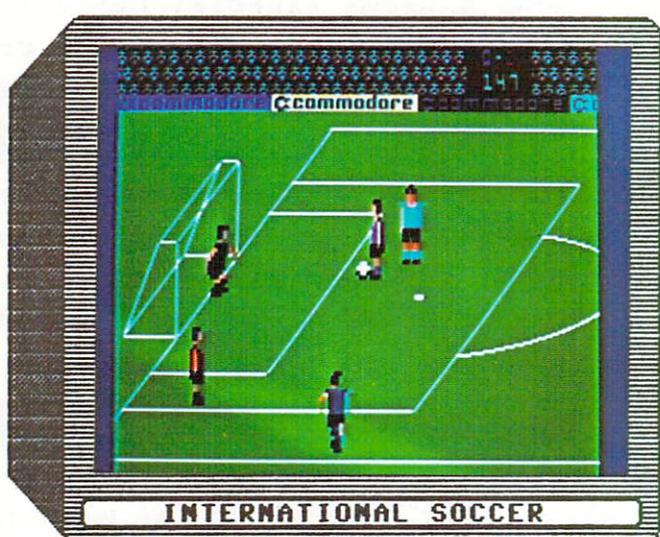
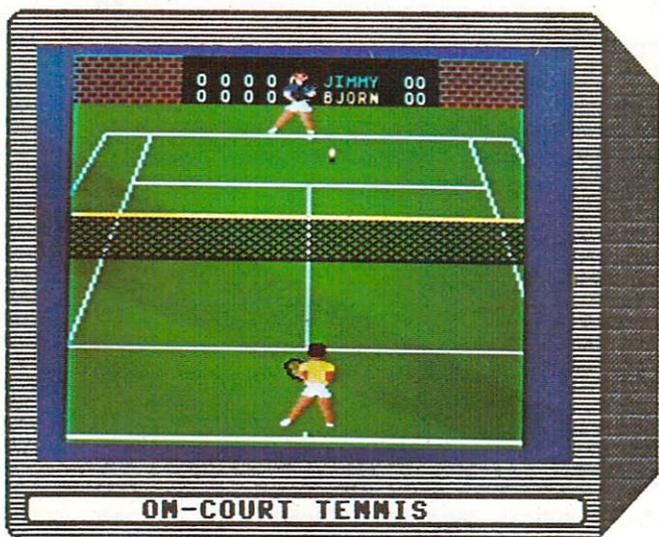
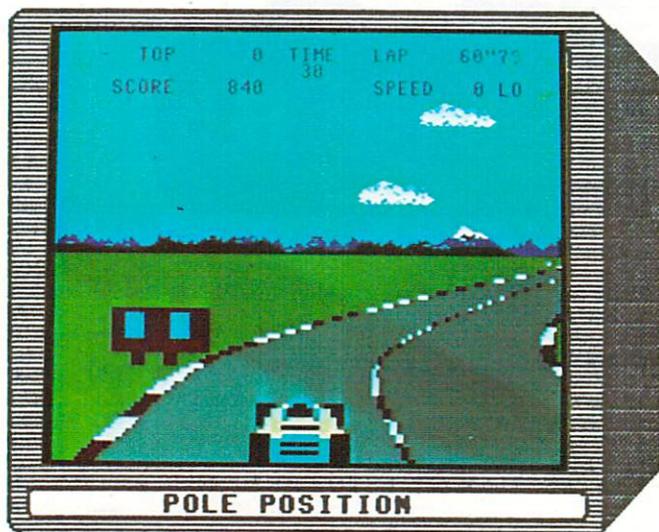
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# GALLERY



# GALLERY

## POLE POSITION

\*\*\*

ATARI SOFT  
PO BOX 2943  
50 SAN FRANCISCO CA 94080

A BIG HIT IN THE ARCADES, THE MAGIC HAS NOT BEEN TRANSLATED WELL FOR THE 64 WITH **POLE POSITION**. CHUNKY GRAPHICS AND ANIMATION, ADDED TO UNSOPHISTICATED SOUND EFFECTS AND UNCONVINCING JOYSTICK RESPONSE, MAKE THIS RACING GAME SEEM LIKE AN AMATEUR EFFORT FROM THE GRANDDADDY OF VIDEO GAMING. **POLE POSITION** MIGHT HAVE LOOKED BETTER IF IT WEREN'T FOR THE STRIKING CONTRAST TO **PITSTOP II** (RIGHT). IF YOU WANT A REALLY HOT RACING GAME, YOU WON'T FIND IT HERE.

## PITSTOP II

\*\*\*\*\*

EPYX  
1043 KIEL COURT  
SUNNYVALE CA 94089

**PITSTOP II** IS NOT ONLY THE BEST CAR-RACING GAME MADE FOR THE C-64, BUT EASILY ONE OF THE TOP 10 ARCADE GAMES OF ALL TIME FOR THE 64! THE DUAL-SCREEN FEATURE IS INCREDIBLE (EACH DRIVER SEEING THE SAME WORLD FROM HIS OWN POSITION)! EVERY DETAIL, FROM THE REALISTIC NEED FOR TIRE-CHANGES AND FUEL, TO THE WAY THE STEERING RESPONDS TO SPEED AND CURVE RADIUS IS THERE. SOUND EFFECTS ARE EXCELLENT (BOTH CAR'S ENGINES ROAR INDEPENDENTLY), AND THE SMOOTH ANIMATION IS FIRST-RATE. 1 OR 2 PLAYERS.

## ON-COURT TENNIS

\*\*\*\*\*

GAMESTAR  
1302 STATE STREET  
SANTA BARBARA CA 93101

LIKE THEIR OTHER SPORTS SIMULATIONS, GAMESTAR'S **ON-COURT TENNIS** FEATURES GOOD ANIMATION WITH A CONVINCING 3-DIMENSIONAL EFFECT (INCLUDING SHADOWS AND FORESHORTENING). ONE OR TWO MAY PLAY, AND YOU HAVE YOUR CHOICE OF SURFACES (CLAY, GRASS, ETC.) & CHARACTERS (BJORN, JOHN, & OTHER WELL-KNOWN). THE JOYSTICK IS PROGRAMMED TO ALLOW A SURPRISING AMOUNT OF CONTROL OVER THE RACQUET (DROP SHOTS, SMASHES, GROUND STROKES, ETC.) THIS IS A FUN GAME THAT CAPTURES MUCH OF THE FLAVOR OF REAL TENNIS.

## INTERNATIONAL SOCCER

\*\*\*\*\*

COMMODORE  
1200 WILSON DRIVE  
WESTCHESTER PA 19380

THIS IS THE BEST GAME COMMODORE HAS COME OUT WITH TO DATE. THE MOST OUTSTANDING THING ABOUT THIS ANIMATED SOCCER SIMULATION, IS THE SMOOTH AND NATURAL WAY THAT CONTROL PASSES FROM PLAYER TO PLAYER WITHOUT THE CONSCIOUS EFFORT AND AWKWARD JOYSTICK MANIPULATION REQUIRED BY MOST OTHER "TEAM SPORT" SIMULATIONS (A COUPLE OF BASEBALL GAMES FROM LAST ISSUE COME TO MIND) AFTER A FEW MINUTES, IT SEEMS LIKE THE COMPUTER JUST KNOWS WHAT YOU WANT TO DO. FAST ACTION, GREAT GRAPHICS, A JOY TO PLAY.

## REALM OF IMPOSSIBILITY

\*\*\*\*\*

ELECTRONIC ARTS  
2755 CAMPUS DRIVE  
SAN MATEO CA 94403

ELECTRONIC ARTS IS BACK ON TRACK WITH THIS UNUSUAL ACTION ADVENTURE. **REALM OF IMPOSSIBILITY** WILL CHALLENGE YOUR GRIP AND YOUR GREY-MATTER AS YOU TEAR AROUND THE NUMEROUS "ESCHERIAN" LANDSCAPES DODGING VARIOUS HAZARDS IN YOUR QUEST FOR TREASURE. WHAT MAKES THIS GAME REALLY OUTSTANDING, THO, IS THE WAY THE TWO-PLAYER MODE FOSTERS COOPERATION (& WITHOUT WHICH YOU ARE BOTH DEAD MEAT). I LOVE THE "WARP-SPEED" SCROLLING BETWEEN SCREENS, AN EYE-OPENING NEW TECHNIQUE WHICH I'M SURE WE'LL SEE MORE OF.

## ANT ATTACK

\*\*\*\*\*

QUICKSILVA  
426 WEST NAKOMA  
SAN ANTONIO TX 78216

**ANT ATTACK** IS STRIKINGLY SIMILAR TO **REALM OF IMPOSSIBILITY** IN MANY WAYS, THO BY DIFFERENT AUTHORS. ANIMATED STICK-FIGURES GO SCURRYING AROUND A 3-D CITY (YOU CAN TOGGLE BETWEEN 4 VIEWS) TRYING TO RESCUE BUDDIES FROM LARGE ANTS (WHO HAPPEN TO EAT ANIMATED STICK-FIGURES) ON-SCREEN INDICATORS HELP YOU LOCATE YOUR COMPANIONS, AND YOU ARE ARMED WITH GRENADES THAT CAN BE TOSSED AT 4 DIFFERENT DISTANCES. LARGE, SCROLLING WORLD OFFERS PLENTY OF VARIATION. A FIRST-CLASS 'FIGHT & FLEE' GAME FOR ONE PLAYER.



# GALLERY

## GUMBALL

★★★★

**BRODERBUND**  
17 PAUL DRIVE  
SAN RAFAEL CA 94903

I SUSPECT RUBE GOLDBERG IS AN UNLISTED CO-AUTHOR OF THIS GAME! STARTS OUT PRETTY EASY, BUT BY THE TIME YOU HAVE BEEN PROMOTED A FEW TIMES, **GUMBALL** WILL HAVE YOU HOPPIN'! THE PREMISE HERE IS SIMPLE: GET YOUR DAILY QUOTA OF COLORED GUMBALLS INTO THE MATCHING COLORED CARS. YOU CONTROL THE VALVES WHICH DIRECT THE COURSE OF THE GUMBALLS, AND YOU CAN MOVE YOUR CARS LEFT AND RIGHT. GET A WRONG COLOR IN THE CAR, AND YOUR SUPERVISOR APPEARS TO DUMP OUT YOUR WHOLE CAR LOAD! WORK YOUR WAY UP TO MORE COLORS & FASTER PRODUCTION. ADDICTING.

## CASTLES OF DR. CREEP

★★★★

**BRODERBUND**  
17 PAUL DRIVE  
SAN RAFAEL CA 94903

IF YOU ARE WORRIED ABOUT "VIDEO MIND-ROT", BUT NO ONE AT YOUR HOUSE WILL TOUCH ANYTHING BUT ARCADE GAMES, THROW THIS ONE AT 'EM. **CASTLES OF DR. CREEP** IS DEFINITELY A GAME, BUT EVERY 'CASTLE' IS ALSO A CHALLENGING MENTAL PUZZLE REQUIRING MEMORY & VISUALIZATION SKILLS OF CONSIDERABLE PROPORTION TO SOLVE. GOOD GRAPHICS & SOUND. CAN GET TEDIOUS IF YOU HAVE TROUBLE SOLVING A PARTICULAR PATTERN, BUT THIS ACTS AS A STIMULUS TO GET IT RIGHT.

## THE SCROLLS OF ABADON

★★★+

**ACCESS SOFTWARE**  
925 EAST 900 SOUTH  
SALT LAKE CITY UT 84105

YOU TRAVEL AROUND ON A SLIDING GRID LOOKING FOR SCROLLS, YOUR TRAVELS ARE COMPLICATED BY THE RESTRICTION THAT YOU MAY NOT RETRACE YOUR STEPS IN AN OPPOSING DIRECTION. SCROLLS, WHEN FOUND, GIVE INSTRUCTIONS FOR USING MAGIC SPELLS, AND ARE DISPLAYED ON THE SCREEN. THIS IS MY LEAST FAVORITE OFFERING FROM ACCESS SOFTWARE SO FAR. COMPARED TO THE QUICK PACED AND VISUALLY RICH GAMES LIKE **REALM** AND **ANT ATTACK**, **SCROLLS OF ABADON** COMES OFF AS A SECOND-STRINGER.

## GRIDTRAP

★★★+

**3R IMPORT CORP.**  
731 JAMES ST. #405  
SYRACUSE NY 13203

IF YOU WANT TO SAMPLE SOME OF THE RECREATIONAL SOFTWARE THAT IS POPULAR IN ENGLAND, YOU CAN FIND QUITE A SELECTION FROM 3R IMPORTS. **GRIDTRAP** IS ONE OF SEVERAL BRITISH IMPORTS WHICH WE HAVE SEEN, AND THEY HAVE A DISTINCT "IMPORTED" FLAVOR. THE IDEA HERE IS TO DEFUSE THE RED BOMB, EVADE THE WANDERING BOAT, STAY CLEAR OF THE SKULLS, AND WATCH FOR TRAPS AS YOU TRAVEL ABOUT THE GRID. THE CLOSEST THING TO **GRIDTRAP** I CAN THINK OF IS THE COIN-OP ARCADE GAME "PENGO". INTERESTING.

## CAVEMAN

★★+

**ZINTA MICRO SYSTEMS**  
PO BOX 946  
EL TORO CA 92630

I HAVE INCLUDED THIS TITLE IN THE GALLERY MOSTLY BECAUSE OF THE FINE GRAPHICS SCREENS AROUND WHICH THIS PREHISTORIC ADVENTURE IS BASED. AS AN ADVENTURE GAME, **CAVEMAN** IS AWFUL. EVERY RESPONSE YOU TYPE IN CAUSES A LENGTHY DISK-ACCESS (AND THERE ARE THREE DISKS WITH BOTH SIDES FILLED!) MAYBE IF STORED TO A HARD DISK THIS GAME WOULD BE PLAYABLE (EVEN SO, THE PARSER IS CRUDE, AND VERY LITTLE OF WHAT YOU SAY IS UNDERSTOOD... VERY FRUSTRATING) I THINK THIS PRODUCT WOULD DO BETTER IF OFFERED SIMPLY AS A STAND-ALONE SET OF COMPUTER-PAINTINGS.

## ROCK N' BOLT

★★★+

**ACTIVISION**  
PO BOX 7267  
MOUNTAIN VIEW CA 94039

YOUR JOB IS TO MOVE UP THRU THE VARIOUS LEVELS OF A SKYSCRAPER, AND BOLT DOWN THE GIRDERS WHICH ARE SLIDING AROUND ALL OVER THE PLACE. YOU HAVE TO ARRANGE THEM IN EXACTLY THE SAME PATTERN AS SHOWN ON THE INSET BLUEPRINT FOR EACH LEVEL (AND STILL LEAVE YOURSELF A PATH BACK TO THE ELEVATOR.) **ROCK N' BOLT** IS A PRETTY CUTE PUZZLE/ACTION GAME WITH SOME NICE EFFECTS AND A MUSICAL SCORE, BUT IT DOESN'T BEGIN TO EQUAL THE CALIBRE OF ACTIVISION'S RECENT HIT, **GHOSTBUSTERS** (MAYBE THAT'S ASKING TOO MUCH.)

# GALLERY

FELIX TOP MICKEY

HEXIS FECUO MASTER

SCORE 52 \*PLTAGA SCORE 31

WORD 3 DERJUGEFS WORD 2

ODRDTU\*PGIG

TIME 0:00 TIMAPHUCVMHLZ LOSS

LTASWOPAABGOR

RPSTJAMRIULBD

DONALD FHEMJHTNS\*B HOODY

SCORE 25 TSVPXNITX SCORE 25

WORD 2 MUTUO\*F WORD 2

INTO DVBOF HANS

HM\*

**PATHWORDS**

PLAYERS SCORES

1 MONTY 1000

2 DONNY 1000

3 GUMBY 1000

4 BOBBI 1000

5 TILES 1000

PREMIUMS

- TRIPLE WORD
- DOUBLE WORD
- TRIPLE LETTER
- DOUBLE LETTER

OPTIONS

- 1 QUIT
- 2 PASS
- 3 PREMIUM VALUES
- 4 TILES
- 5 CHANGE
- 6 JUGGLE
- 7 HINT
- 8 SWAP

GUMBY IS THINKING

VIGIL 18

RIZILUJL

**MONTY PLAYS SCRABBLE**

Trivia Fever

Question for team #2: YALE

Question Category is:  
Famous People

Selected Difficulty Level is: 2

Time Remaining: 0 Seconds

Which two men traveled across half of North America to discover the Pacific?

Sorry, YALE. Your time has elapsed.

The correct answer is:  
Lewis and Clark

Please PRESS <SPACE BAR> to continue

**TRIVIA FEVER**

ARCHER, YOU ARE AT:  
Guancial's Bar

YOUR CHOICES:

1. Talk to Sal Madalena, bartender
2. Talk to Vincent Guancial, owner
3. Talk to Mendy Fletcher, barmaid

4. Go over the books

5. Search Guancial's office

6. Check out the barroom

YOUR CLUES ARE:  
206,310,285

TAP ANY KEY TO CONTINUE

**MURDER BY THE DOZEN**

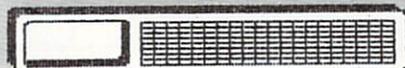
**TARGON-64**

SCORE: -11

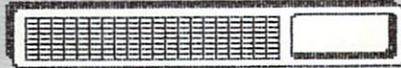
SABINUS---MEN: 1380 SWORDS: 1380

ORDERS: CANCEL - GIVE

**LEGIONNAIRE**



INTEL 164



# GALLERY

## PATHWORDS

\*\*\*+

CBS SOFTWARE

GREENWICH CT 06836

**PATHWORDS** IS AN INTERESTING VARIATION OF THOSE WORD GAMES YOU SEE ON PAPER, WHERE YOU HAVE TO FIND THE HIDDEN WORDS FROM A SOLID MASS OF LETTERS, AND DRAW A CIRCLE AROUND EACH ONE. CBS IMPROVES ON THIS THEME BY ALLOWING WORDS TO BE MADE BY ANY CONTINUOUS PATH OF LETTERS (TWISTS & TURNS ALLOWED), AND BY REPLACING USED LETTERS WITH NEW ONES (WHICH INTRODUCES A DEFENSIVE ELEMENT WHEN PLAYING WITH OPPONENTS.) PLAYERS MUST AGREE ON THE VALIDITY OF WORDS, BUT THE COMPUTER DOES THE SCORING.

## MONTY PLAYS SCRABBLE

\*\*\*\*\*

EPYX  
1043 KIEL COURT  
SUNNYVALE CA 94089

THE PROCESS OF COMPUTERIZING SCRABBLE (THE ALL-TIME BEST-SELLING WORD GAME) HAS NOT ONLY LEFT THE ORIGINAL GAME INTACT, IT HAS ENHANCED IT TREMENDOUSLY. FOR SOLITAIRE OR MULTIPLE PLAYERS, **MONTY** OFFERS A COLORFUL BOARD, 12,000-WORD ON-LINE DICTIONARY, AND A HOST OF OPTIONS INCLUDING VARIABLE COMPUTER INTELLIGENCE, GAME SPEED, DISPLAYS OF TILE-COUNTS, POINT VALUES, BONUS VALUES, AND VISIBLE OR HIDDEN GAME RACKS. SOUND EFFECTS ARE JUST RIGHT. SCRABBLE LOVERS WON'T BE DISAPPOINTED.

## TRIVIA FEVER

\*\*\*+

PROFESSIONAL SOFTWARE  
PO BOX 533  
NEEDHAM MA 02194

YOU ARE PROBABLY REACHING THE THRESHOLD OF "TRIVIA OVERDOSE" BY NOW, BUT IF NOT, THEN **TRIVIA FEVER** BELONGS WITH THE REST OF YOUR COLLECTION. THIS VERSION IS NOTABLE IN THAT IT CAN BE PLAYED WITH OR SANS COMPUTER, AND OFFERS NUMEROUS HANDICAPPING FEATURES TO HELP INSURE A FAIR AND INTERESTING GAME. INCLUDES GAME SPINNER, TALLY SHEETS, QUESTION & ANSWER BOOK, AND DISK WITH THOUSANDS OF QUESTIONS. ADDITIONAL VOLUMES OF QUESTIONS AVAILABLE ON DISK.

## MURDER BY THE DOZEN

\*\*\*+

CBS SOFTWARE  
GREENWICH CT 06836

**MURDER BY THE DOZEN** IS AN ENGROSSING COLLECTION OF DETECTIVE ADVENTURES FOR ONE TO FOUR PLAYERS. ASSUMING YOUR FAVORITE SLEUTH PERSONAS, YOU WILL SEARCH FOR CLUES, QUESTION SUSPECTS, DRAW YOUR CONCLUSIONS AND FINALLY ANNOUNCE YOUR SOLUTION. INCLUDES CLUE BOOK AND CASE ANSWER BOOK. LIMITED GRAPHICS ENHANCE THIS BASICALLY TEXT-BASED ADVENTURE. 12 CASES TO CRACK- ADDITIONAL MYSTERIES AVAILABLE ON DISK, GOOD FAMILY FUN.

## TARGON 64

\*\*\*

NET SOFTWARE

LANGLEY BC CANADA

PRETTY STANDARD SPACE SHOOT-EM'-UP FAIR HERE, WITH SOME BETTER-THAN-AVERAGE SPRITE DESIGN (WHICH RESULTS IN SOME TARGETS THAT ARE NOT UNLIKE THOSE FOUND IN THE ATARI ARCADE HIT, XEVIOUS). WHAT ELSE CAN I SAY (EXCEPT THAT, HAVING MENTIONED "XEVIOUS", I WONDER IF ATARI WILL RELEASE A VERSION FOR THE 64, OR, EVEN BETTER, THE C-128!)

## LEGIONNAIRE

\*\*\*+

AVALON HILL  
BALTIMORE MD

**LEGIONNAIRE** IS A STRATEGIC WAR-GAME SIMULATION WHICH PUTS YOU OUT IN THE FIELD AS JULIUS CAESAR WITH NOTHING BUT BLOOD-THIRSTY BARBARIANS FROM HORIZON TO HORIZON. THE SOUND EFFECTS ARE REAL BASIC (THE SIMPLE "TRAMP-TRAMP") OF MARCHING BOOTS MAY MAKE YOU CHUCKLE. GAME CONTROLS ARE PRETTY GOOD, AND THE SCROLLING BATTLEFIELD IS FINE. I THINK THIS GAME IS A REASONABLE INTRODUCTION FOR THOSE WHO ARE INTERESTED IN WAR-GAMING, BUT ARE PUT OFF BY THE BOARD VERSIONS WITH ALL THE PARAPHENALIA.



## PRODUCT ROUNDUP

The first thing I want to do is clarify and update INFO-64's Product Roundup plans. Some of our faithful subscribers have expressed some confusion and anxiety about how and when the special Product Roundup issues will be available. The Product Roundup will be a massive compilation of products for your computer, organized by categories, with ratings (where available), descriptions, photos, and vendor information. It will come out twice a year: once around June/July, and then again around Nov./Dec. as an expanded part of the magazine. For subscribers, these will constitute 2 of each 6 issues you receive, and while they will probably have a higher cover price at the newsstand, there is no extra charge for subscribers.

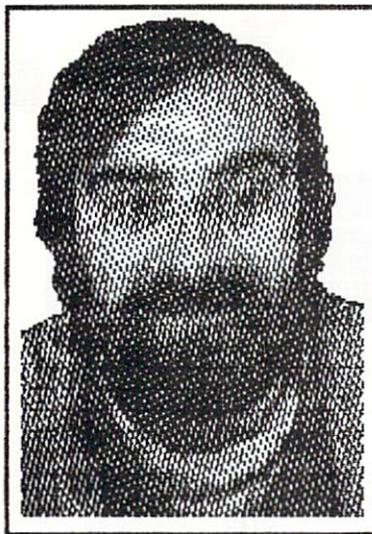
## 'OTHER' MAGAZINES

Next, I want to air some personal observations about 'the other' computer magazines. Like many of you, I am a magazine 'junkie' (tho my habit probably makes yours look tame). I read them all, partly for pleasure, and partly for business. Lately, I am sad to say, I am seeing more negative than positive trends. Here are a few of the low points in my opinion:

\* **InfoWorld**, which used to be my favorite, took a real nose-dive when Stewart Alsop resigned his position as Editor last November. Since then, the once fiesty, witty, & gutsy computer news-weekly has become just another echo in the dusty halls of rubber-stamp publishing. My condolences to the remaining scrappers at **InfoWorld** who must work under the new regime.

\* **RUN** was, for a long time, my favorite Commodore-specific mag. Then they tried to sell us on the **PLUS/4** (keeping it up for 3 issues straight, long after everybody else had seen it for the flop that it was). But even more annoying to me, was their January 1985 review of light pens, in which they took a 'close look' at **Flexidraw** (a product with which I am intimately familiar) and were not impressed. It is not hard to understand why they weren't impressed: the version reviewed was 2.0 (which had been obsolete for at least 9 months when this 'review' was printed!). The version on sale while that review was on the stands was 5.0, the most sophisticated hi-res light pen graphics package you can get this side of a Macintosh dealer! How can a magazine keep the respect of its readers with that kind of useless reporting?

\* **AHOY!** seems to have been struggling along in the distance behind **RUN** & **COMPUTE!'S GAZETTE**. Now I hear that Managing Editor, Bob Sodaro, has left for greener pastures. I met Bob at Winter CES, and I have to think that his departure will take some spunk and fun out of **AHOY!**



\* **COMPUTE & COMPUTE!'S GAZETTE** seem likely to catch some reader flak from their latest maneuver: the release of **SpeedScript 3.0** (find your free Erg=Card for this software in the centerfold). The problem is that **SpeedScript**, **COMPUTE!'S GAZETTE**'s most popular feature of all time, was available on disk to subscribers of **COMPUTE!'S GAZETTE DISK** as part of their subscription. It was beleived by many subscribers I have talked to that the much-anticipated upgrade, **SpeedScript 3.0**, would be published in a future issue of **GAZETTE**, and thus automatically be theirs as part of their subscription. Turns out that they will have to type it in from **COMPUTE!**, or shell out \$14.95 to get a copy on disk! Never mind that it may be worth every penny!, the overwhelming impression is that the readers are being milked for every spare nickel! Boys and girls, can you say "250,000 new software pirates overnight"? Sure you can.

There is one particular high-point in this otherwise gloomy picture of computer publishing: the **WHOLE EARTH REVIEW**. This is a bi-monthly synthesis of 2 other excellent magazines (**CoEvolution Quarterly**, & **Whole Earth Software Review**) that apparently couldn't make it as separate titles (despite Stewart Brand's legendary advances to put out the latter.) The new publication, like its parents, contains no advertising and now covers a spectrum of interesting topics from growing bamboo, to Superbase 64! Subscriptions to **WHOLE EARTH REVIEW** are \$18 per yr. (call 1-800-321-3333 VISA etc.)

Last, I would like to point out that **INFO-64** is the only magazine to date that is running actual pictures of the **C-128** and **LCD** computers. The photos you may have seen in **BYTE**, **RUN**, & even **COMMODORE** magazine (!) are press-kit photos of early non-working mock-ups. How can you tell? The keys of the 'real' **C-128** have graphics symbols on them (like the one pictured on our cover), and the **LCD** has the lower, close-fitting keys as shown on our cover, and in 'News & Views'. All the magazines had reporters and (presumably) cameras there in Las Vegas, and **COMMODORE** magazine, at least, should have access to current equipment. I just thought you'd like to know.

-Benn Dunnington / Editor



# INFO READER MAIL

INFO-64;

I READ WITH GREAT DESPAIR YOUR REVIEW OF THE **INDUS GT** DISK DRIVE FOR THE **C-64** COMPUTER. I REALLY FEEL THAT YOU HAVE DONE YOUR READERS A NEGATIVE SERVICE ON THIS ONE.

I DID A REVIEW OF THE **INDUS** DRIVE IN OUR DEC. USERS GROUP NEWSLETTER AND DID NOT FIND IT TO BE WORTH THE \$399 PRICE TAG AT ALL. THE ONLY POSITIVE FEATURES THAT I FELT IT HAD GOING FOR IT WERE THE OPTO-ELECTRONIC STOP AND THE DISK DOOR DUST COVER.

THE REASON THAT SOME PROGRAMS WON'T LOAD WITH FAST ROUTINES IS THAT NO ONE HAS COME UP WITH A ROUTINE THAT WILL SUPPORT THE U1 OR UA FUNCTION OF THE DRIVE AND THIS IS THE FUNCTION THAT IS USED IN LOADER ROUTINES FOR PROGRAMS LIKE **SUPERBASE & EASYSRIPT**, ETC. PUT THIS ON TOP OF THE FACT THAT WHEN **SUPERBASE** IS LOADED INTO THE COMPUTER, THERE IS NO PLACE LEFT IN COMPUTER RAM FOR FAST READ AND WRITE ROUTINES TO RESIDE, THESE ROUTINES HAVE TO BE EXTERNALLY SUPPORTED. IN OTHER WORDS THEY SHOULD BE A PART OF THE DRIVES' OPERATING SYSTEM, NOT ADDED ON AS AN AFTERTHOUGHT. THE REAL POWER OF SOMETHING LIKE THIS WOULD BE IN SORTING AND ACCESSING **SUPERBASE**-TYPE FILES.

WITH THE EXCEPTION OF THE OPTO-ELECTRONIC STOP, I DID NOT FIND THE **INDUS** DRIVE TO BE SUPERIOR IN ANY WAY TO A 1541 W/ **KWIK LOAD**. (**KWIK LOAD**, BY THE WAY, IS ALSO AVAILABLE FROM DATAMOST FOR ABOUT \$20.00) I HAVE INCLUDED MY OWN REVIEW IF YOU WISH TO PRINT IT IN YOUR NEXT ISSUE.

THANK YOU: -BRUCE R. SCHROEDER  
EDITOR-PUBLISHER  
CHIPPEWA VALLEY  
C-64 USERS' GROUP NEWSLETTER  
CHIPPEWA FALLS, WI

Dear Bruce;

We apparently got a **LIME** (that's where most of the units are bad, but you get the oddball in the lot that is good!). While other readers have reported that their **INDUS** drives do work with **SuperBase**, most have reported quality control problems (one reader was on his **FIFTH** replacement). Hopefully, **INDUS** will learn from all this and incorporate the improvements into their new double-sided drive that was shown (mocked-up) at CES (like the regular **INDUS**, it is handsomely styled, this time in a low flat box with a slide-out disk-drawer like you find on most compact audio disc players!) Thanks for the review, but I think our other readers are getting the gist by now- try before you buy (even **INFO-64** may not see it the way you will.)

## RESPONSE TO STEVEN LUEDDERS' LETTER [INFO #5]

I RUN A SOFTWARE COMPANY SO I DECIDED THAT I HAD BETTER GET ALL THE FACTS ABOUT COPY-PROTECTION SO THAT I COULD FIND OUT WHICH PROTECTIONS SCHEME IS BEST. HERE IS A SMALL PART OF WHAT I FOUND.

**WHY PROGRAMMERS PROGRAM.** FIRST OF ALL, I AM A PROGRAMMER AND I HAVE SEVERAL FRIENDS THAT ARE PROGRAMMERS AND WE ALL PROGRAM FOR THE SAME REASON: **WE LOVE IT!** WE SURE AS HECK AREN'T IN THIS FOR THE MONEY. IF I WANTED MONEY I'D BE A LAWYER.

**PIRATED SOFTWARE IS BETTER THAN THE ORIGINAL.** [break] UNPROTECTED AND DEPROTECTED SOFTWARE: MAY BE QUICKLY AND EASILY BACKED UP WITHOUT A NIBBLER OR ERROR COPIER / LOADS MORE QUICKLY AND EASILY AND DOES NOT TEAR UP THE DRIVE / CAN USUALLY BE PLACED ON A DISK WITH OTHER SOFTWARE, THUS CONSERVING DISK SPACE / IS EASIER TO MODIFY AND TAILOR TO YOUR OWN NEEDS.

I USE AN **MSD** DUAL DRIVE AND I HAVE PURCHASED SEVERAL **ELECTRONIC ARTS** PROGRAMS, NONE OF WHICH WILL EVEN LOAD. I AND OTHERS ARE THEREFORE **FORCED** TO OBTAIN BROKEN COPIES. [break]

**PROTECTION IS IMPOSSIBLE** EVERY PROTECTED PROGRAM THAT THERE EVER WAS HAS BEEN CRACKED. PROBABLY 50% OF ALL PROTECTED SOFTWARE IS CRACKED IN UNDER 10 MINUTES. [break] AN **ELECTRONIC ARTS** REP. TOLD [a software pirate] THAT THE COPY PROTECTION ON **ARCHON II** WAS SO ADVANCED THAT IT WOULD BE "90 DAYS" BEFORE IT WAS CRACKED. LITTLE DID HE KNOW THAT IT WAS BEING PASSED AROUND AS HE SPOKE.

**EVERYBODY PIRATES** DON'T TRY TO GIVE PEOPLE ALL THIS "HOLIER THAN THOU" STUFF, STEVEN. EVERYBODY PIRATES TO SOME EXTENT OR OTHER, EVEN IF ONLY ONE PROGRAM ONE TIME. [break] YOU'D BE HARD PRESSED TO FIND A COMPUTER ROOM IN A SCHOOL THAT DIDN'T HAVE AT LEAST A COUPLE OF BOXES OF PIRATED SOFTWARE.

**THE ANSWER:** IF ALL YOU GAME DESIGNERS AND COMPANIES OUT THERE WANT TO KNOW WHAT THE BEST COPY PROTECTION IS, THEN DO WHAT YOU WOULD IN AN ADVENTURE: "LOOK". LOOK AT THE COMPANY WITH THE LARGEST PROFITS- **INFOCOM**. THEY HAVE NO COPY PROTECTION (GASP!) YET THEY CONSISTENTLY PRODUCE BEST-SELLERS. THIS WOULD SEEM TO BE A LIVING CONTRADICTION TO MR. LUEDDERS' IDEAS AND HIS "SKY IS FALLING" SCENARIO. **INFOCOM** MAKES QUALITY SOFTWARE WITH QUALITY DOCUMENTATION THAT PEOPLE WANT TO BUY. IF SOMEONE WILL WRITE QUALITY SOFTWARE THEN PEOPLE WILL BUY IT. **REMEMBER, YOUR CUSTOMERS ARE YOUR FRIENDS, NOT YOUR ENEMIES.**

**THE POINT** OF ALL THIS IS THAT COPY PROTECTION IS A WASTE OF TIME, EFFORT, AND MONEY, AND IS AN AFFRONT TO THE LEGITIMATE CUSTOMER WHO IS ENTITLED TO THE BEST VERSION OF THE PRODUCT AVAILABLE.

I THEREFORE MAKE THIS STATEMENT: I, **PHOENIX RED**, STEADFASTLY OPPOSE ALL FORMS OF COPY PROTECTION AND YOU CAN BET YOUR DISK DRIVE THAT NONE OF OUR PRODUCTS WILL EVER BE COPY PROTECTED.

SINCERELY,  
PHOENIX RED (JIM CONWELL)  
PHOENIX RED SOFTWARE  
HOUSTON TEXAS

Thank for your letter, RED. This is clearly not an easy issue. We now have 2 professional programmers diametrically positioned on an issue which affects their livelihood, and the quality of computing for the consumer. **INFO-64** welcomes any **NEW** insights which readers may have, since we are sure there is, somewhere, a solution that will respect the concerns of all parties.

- Benn



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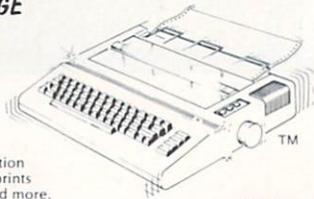
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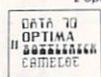
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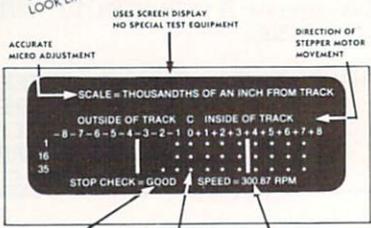
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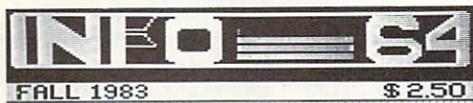
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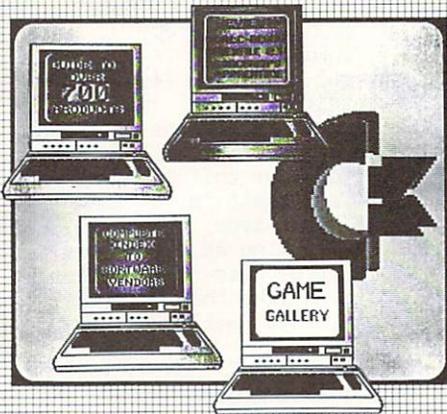
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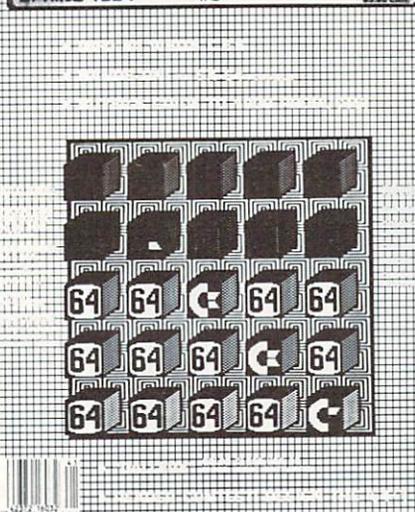


ISSUE #1

REVIEWS \*FlexFile 2.1  
\*Calc Result  
\*Sorcerer's - Apprentice

also \* Hot-wiring the 1701  
\* Gallery  
\* News & Views

**PREMIERE  
ISSUE**

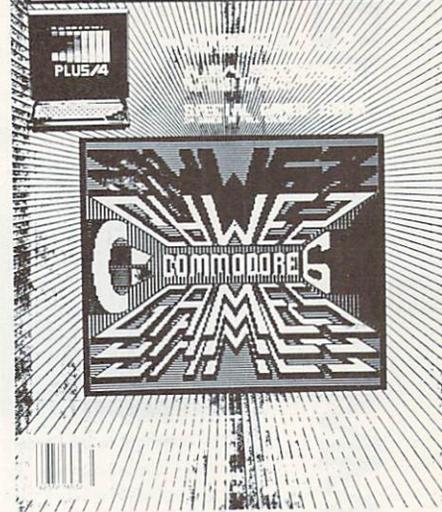


ISSUE #3

REVIEWS\* Superbase 64  
\* CBM LOGO  
\* C64 FORTH  
\* Model Diet  
\* Computer Mechanic

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\* Applications Generators: why you don't need them  
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▷SUPERBASE 64  
▷DOODLE  
▷COMMODORE LOGO



ISSUE #5

REVIEWS\* PLUS/4  
\* KOALA LIGHT PEN  
\* INDUS DISK DRIVE  
\* EXODUS: ULTIMA III  
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# NEWS & VIEWS

## SPECIAL C.E.S. EDITION

REPORTED BY:  
**Benn Dunnington**

# COMMODORE 128

## PERSONAL COMPUTER



### The Commodore 128 Personal Computer features:

- 128K RAM for advanced applications and increased productivity
- User selectable 40/80 column full color display
- Numeric Key Pad to increase data entry efficiency and accuracy
- Optional 1571 fast disk drive saves time and increases productivity
- Runs off-the-shelf CP/M™ software such as WordStar™, dBase II™ and The Perfect Series™
- User Expandable to 512K for rapid data access with RAM disk expansion modules
- 100% compatible with Commodore 64 software and peripherals

The Consumer Electronics Show (C.E.S.) is the biggest and, in my opinion, the most important show for Commodore in this country. It is also the only show INFO-64 regularly attends and (unfortunately for most readers) open only to dealers, manufacturers, and the media. Not to worry, we're going to take you there now (you wouldn't have been able to find a hotel room anyway!)

Ok... We decide to check out Commodore first (we'll look at ATARI and third parties later.) We pick up our official Commodore press kits (the important sheets from Commodore's press kit have been reproduced on these pages for your enlightenment and enjoyment...I hope Commodore doesn't mind the free exposure...sorry about the small type, maybe you can find a magnifying glass.) Looking at the photos we wonder if we got the right press kits- the equipment pictured doesn't look anything like the PETs, VICs, and 64s we've come to know & love (well, usually).

Pushing our way thru the hordes of over-stimulated show-goers we try to find the Commodore booth. There it is, a beckoning Mecca of technological wonders... about a half-mile away, rising in the misty distance of the huge convention building.

We press onward past all manner of spectacles and ballyhoos designed to lure even the most shell-shocked electronics-peddler closer for a better look at the product: there are numerous mimes silently conveying the pleasures of owning new video cameras, there is the 'Federal Express guy' from the TV ads with his mouth approaching the speed of sound itself (we don't know what he's pitching, but we're sure we need it in a hurry!), there is a guy doing an incredible robot impersonation that is totally convincing. While pausing for a moment near the Batteries Included booth to get our bearings, I feel somebody pinch me! Spinning around, there is no one to be seen within striking distance. Hmmm, no one except a life-size doll of 'Herbie', Batteries Included's spectacled mascot. Hmmm.

We finally arrive at Commodore's booth. Most of the large display area is devoted to the new equipment. There, in a crowd, is the much-anticipated C-128! We realize at once that our greatest fear (that the C-128 would just be a 64 with a numeric pad and a Data 20 Z80 cartridge welded to the circuit board with a bank-switched 64K all jammed into a surplus 364 keyboard unit) is not to be.

Not only is the C-128 obviously a totally new machine, but we notice with growing delight that there are several other new products on display that had not even been rumored before the show (and all echoing the stunning good looks of the C-128)! Now I pinch myself to make sure I'm not dreaming (where's Herbie when you need him?): there before our eyes is a working model of a Commodore lap computer with a remarkably readable 80 column X 16 line liquid crystal display!

## COMMODORE 128

## PERSONAL COMPUTER

### GENERAL FEATURES

- Advanced Styling • 100% Compatible with Commodore 64
- Built-in, Easy to Use DOS support • RAM Expandable up to 512K
- RAM Using RAM Disk Option • Upper and Lower Case Character Set
- Built-in BASIC • 3 Separate Modes of Operation

### 64 MODE

- 6510 Compatible Microprocessor (1.02 MHz) • 6581 Sound Interface Chip • 64K RAM • 16K ROM • BASIC 2.0 • 40 x 25 Lines (320 x 200 resolution) • 16 Colors + 8 Sprites

### 128 MODE

- 8502 Microprocessor (1 or 2 MHz) (6502 Compatible)
- 6581 Sound Interface Chip • 128K RAM (Expandable to 512K Using RAM Disk Option) • 48K ROM + 16K ROM for DOS Support
- BASIC 7.0 • Machine Language Monitor • 40 x 25 Lines (320 x 200 resolution) • 80 x 25 Lines (640 x 200 resolution) • 16 Colors + 8 Sprites (40 Column Only)

### CP/M MODE

- Z80A Microprocessor (4 MHz) • CP/M™ Plus Version 3.0
- 128K RAM (Expandable to 512K Using RAM Disk Option)
- 40 x 25 Lines (320 x 200 resolution) • 80 x 25 Lines (640 x 200 resolution) • 16 Colors

### KEYBOARD

- Full Size Typewriter Style • 92 Keys • 14 Key Numeric Keypad
- 8 Programmable Function Keys • 6 Cursor Keys • Help Key
- 40/80 Column Key • No Scroll • Line Feed • Escape • Tab
- Cap Lock • Alt

### INPUTS/OUTPUTS

- User Port
- Cassette Port
- RF/TV Port
- Audio Input
- Composite Video
- Serial Port
- 2 Game Ports
- Cartridge Port
- Audio Output
- Digital RGBI Video

### RECOMMENDED PERIPHERALS

- MPS 802 or MPS 803 Printers • 1571 Single Disk Drive
- 1901 Monochrome Monitor • 1902 Digital RGBI Color Monitor
- 1660 and 1670 Modems • Fully Compatible with Commodore 64 Software and Accessories

### DIMENSIONS

- 56mm x 432mm x 324mm (H x W x D)

### WEIGHT

- 5 lbs. 6 oz.

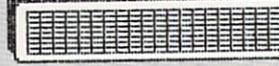
### COLOR

- Light Beige

### POWER REQUIREMENTS

- 117 Volts AC, 60 Hz, 15 Watts

**COMMODORE**



## COMMODORE 1571

## DISK DRIVE

### GENERAL FEATURES

- 5 1/4" Floppy Disk Drive
- Supports Fast Data Transfer Rates
- Two Serial Ports for Adding Peripherals
- Software Disk Format Selectable
- Comes With Serial and Power Cables
- Compatible with Commodore 128, 64, Plus/4, and LCD Computers

### SYSTEM FEATURES

- Built-in 6502 Microprocessor
- 2K RAM
- 32K ROM
- Built in DOS
- High Data Transfer Rates
  - 300 cps under C64 Control
  - 1500 cps under C128 Control
  - 3500 cps under CP/M™ Control
  - Up to 4000 cps Burst Rate

### MEDIA

### CHARACTERISTICS

- Commodore Standard (GCR)
- Double Sided/Single Density
- 350K Storage Capacity (Formatted)
- Compatible with 1541 and 2031 Disk Drives
- Supports Program, Sequential, Relative and User Files
- CP/M™ Compatible (MFM)
- Double Sided/Double Density
- Up to 410K Storage Capacity (Formatted)
- Boots up in IBM™ System 34 Format, (Kaypro™ and Osborne™ Format Compatible)
- Supports most CP/M™ Files

### INPUTS/OUTPUTS

- Two Serial Ports
- Power Connector

### DIMENSIONS

- 76mm x 216mm x 346mm (H x W x D)

### WEIGHT

- 6 lbs. 12 oz.

### COLOR

- Light Beige

### POWER REQUIREMENTS

- 117 Volts Ac, 60 Hz, Less than 25 Watts

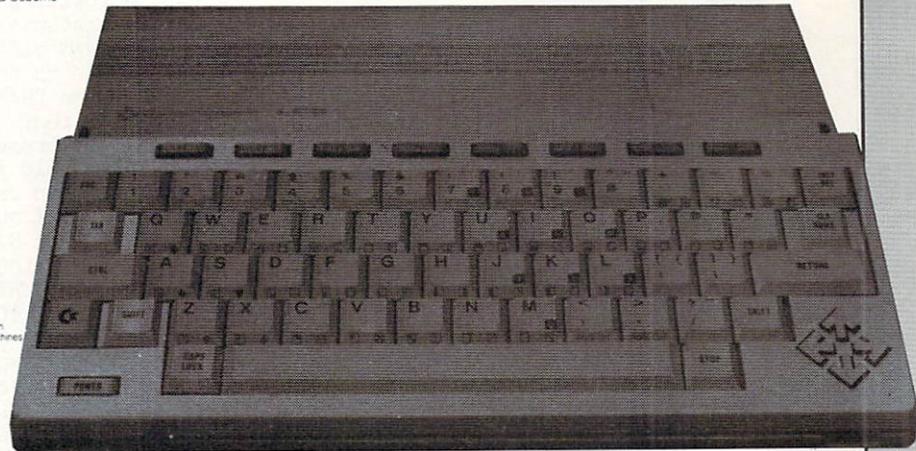
**COMMODORE** 

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# NEWS & VIEWS

## SPECIAL CES EDITION

I run over to a guy demonstrating one of these units to ask a few questions. He turns out to be one **Jeffrey Porter**, one of the co-designers of the LCD (as it is called). We are surprised at how young and intelligent he looks (we have met 'project' types from Commodore before who would not necessarily fit this description). While we take turns vigorously shaking his hand, Jeff explains that he is a former C-64 'hacker' like us, and was recruited by Commodore to design "the machine you'd want for yourself". What a concept! We stop to read our product sheets. [stop here and read your LCD press sheets] I take a close-up photo of the keyboard [see Fig. 1] noticing that it is different from the one shown in the



**FIG. 1**

standard press photos in our kit. Jeff explains that the press kit photos are of early mock-ups, and that the close-fitting keys of the unit on display would be used in actual production. We agree that they have a nice feel, and look better than the earlier version.

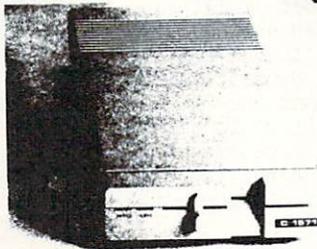
We are slightly disappointed to learn that the LCD is not C-64 software-compatible, but are impressed with the extensive built-in software which looks much more professional than the PLUS/4 built-ins. I know a lot of people that will be delighted with the built in MODEM and the on-board terminal software which can emulate both the DEC VT52 & VT100 terminals. I mentally go over some of the other pluses: 5hrs. operation on 4 penlight batteries, only 5lbs. total weight, fits in my briefcase, compatible with all C-64 peripherals, expected price- under \$500)

I ask Jeff about some items not covered by the press materials; Is the 32K RAM expandable? Jeff thinks it will be, but doesn't say by how much; does the use of the 6502-compatible 65C102 processor mean that the LCD will be able to use Bill Mensch's fabled 65816 "Superchip" from Western Design Center [see 'News & Views', iss. #5]? a smile flickers over Jeff's lips, and his eyes go slightly out of focus as he replies simply, "We're talking about it."



COMMODORE 1571

## DISK DRIVE



### The Commodore 1571 1/2 megabyte 5 1/4" disk drive:

- Capable of running fast data transfer rates which saves time and increases productivity
- Storage capacity of 350K for large data storage requirements
- Format programmable allowing CP/M™ software compatibility to most computers
- Completely compatible with Commodore 128, 64, Plus/4 and LCD Computers

**COMMODORE** 





**The Commodore LCD Portable Computer features:**

- Built in applications software designed for maximum productivity
- Easy to read, 80 x 16 liquid crystal display provides large screen display
- CMOS technology for long life battery operation
- Built-in modem and terminal emulator software for telecommunications
- Lightweight, compact size designed to fit into most briefcases
- Ideal for anyone on the move!

**COMMODORE** 

# NEWS & VIEWS

## SPECIAL CES EDITION

We also want to know more about the 3.5" micro-floppy [see Fig. 2] we see hooked up to the LCD. All we can find out is that it is a "Sony-compatible" drive that hooks up to the serial port of any of the Commodore computers (the peculiar thing is that, while other 3.5" drives typically store 1/2 to 1 full megabyte, we are told that this unit will only store a measly 170K- just like the 1541 ! "Why" was not explained).

Back over to the C-128, we add to the information in our press kits by discovering that the C-128 is actually 3 computers. In the C-64 mode there is no operational difference from a regular C-64 (no speed or RAM difference - you must be in the 128 or CP/M modes to access the 80 columns or extra 64K of RAM). In the CP/M mode, all CP/M 3.0 compatible software will run. We couldn't verify it, but we are under the impression that this means that any commercial CP/M sold for the Kaypro or Osborne 8-bit computers will run as-is (this would include such favorites as DBASE II and WORDSTAR). In the 128 mode a whole range of 80-column, 128K, color software will be forthcoming (we saw an impressive demo of the popular PERFECT WRITER [see cover photo] and other titles in the 'PERFECT' series are scheduled for release soon.

For the expected price of \$300, we agree that this should be a very popular machine, especially in light of its claimed 100% compatibility with the C-64! We have only a few complaints: we wish there had been an IEEE port built in, a better layout for the numeric pad and cursor keys, and (with Commodore's rights to the MS-DOS Hyperion) it would have been an even more dynamite product if the 128 mode were an IBM mode and the 8502 processor had been an 8088 or an 8086 (it would also have been the nail in the coffin of a couple of dozen other computer companies, including ATARI!) As it stands, ATARI AND COMMODORE are likely to keep battling it out for the rest of the year.

### COMMODORE LCD

### PORTABLE COMPUTER

#### GENERAL FEATURES

- Built-in Applications Software
- Built-in 300 Baud Modem for Telecommunications
- Runs on Batteries or External Power
- Automatic Power Down that Saves Battery Life
- Fits Easily into Most Briefcases

#### BUILT IN SOFTWARE

- Wordprocessing
- Scheduler
- BASIC
- File Manager
- Calculator
- Monitor
- Spreadsheet
- Memo Pad
- Address Book
- Terminal Emulator

#### SYSTEM FEATURES

- 65C102 CMOS Microprocessor (1 Mhz)
- 32K CMOS RAM
- 96K CMOS ROM
- Built-in BASIC 3.6
- Built-in System Utilities

#### DISPLAY

- 80 x 16 Liquid Crystal Display
- 480 x 128 Resolution (Graphics Mode)
- Upper and Lower Case Characters

#### KEYBOARD

- Typewriter Style
- 72 Keys
- 8 Programmable Function Keys
- 4 Cursor Keys

#### INPUTS/OUTPUTS

- Serial I/O Port
- RS-232 C
- Centronics Parallel Port
- Modular Phone Jacks for Direct Connect Modem
- Expansion Port
- Bar Code Reader Port (Hewlett/Packard Compatible)

#### RECOMMENDED PERIPHERALS

- 1541 or 1571 Single Disk Drive
- MPS 802 or MPS 803 Printers
- All Commodore Serial Peripherals are Compatible

#### DIMENSIONS

- 2.1" x 10.5" x 11.7" (H x W x D)

#### WEIGHT

- 5 lbs. 5 oz.

#### POWER REQUIREMENTS

- 4 AA Alkaline Batteries (15 power hours)
- 500 Milliwatts
- NiCad Battery Backup
- A/C Adapter Included

#### COLOR

- Light Beige

**COMMODORE** 

(Specifications subject to change without notice)



**commodore  
MOUSE**



# NEWS & VIEWS

## SPECIAL CES EDITION

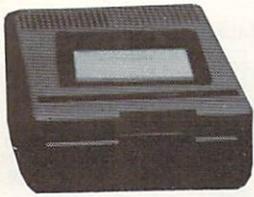
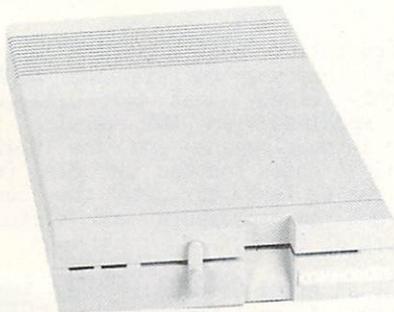
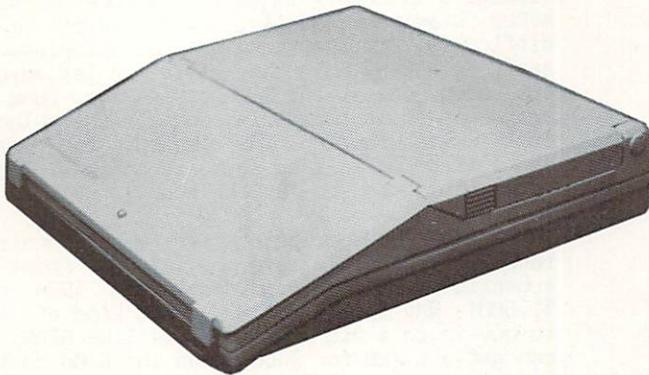


FIG. 2



Shifting our attention now to the peripherals, we notice again the smashing new 'look' shared by all the new **Commodore** products (we find out later that this is mostly the doing of an in-house designer at **Commodore** named 'Minh' who we think should get a medal of some kind!)

The new **1571** disk drive is also a 3-in-1 deal which matches itself intelligently to the mode of the computer using it, as well as the format of disk being accessed- thus it can automatically tell that it is being used with a **C-128** in the **CP/M** mode and that the diskette is in Kaypro format, and act accordingly! We learn that there is also a dual version of this double-sided drive that will be introduced later this year. The good news is that the **1571** will work with all **Commodore** computers (including the **C-64** and the **LCD**); the bad news is that it has neither greater speed or greater capacity than a **1541** when used with the **C-64** or in the **64** mode with the **C-128**; back to the good news, it is 5 times faster than the **1541** in the **128** mode, and 10 times faster in the **CP/M** mode! Also guaranteed to please is the expected price: \$199!"

A quick look at the new **1902 RGB** monitor (necessary for 80-column color) and the **Commodore Mouse** finishes our tour thru the **Commodore** booth. As we say goodbye to Jeff and the other (obviously pleased) booth-dwellers, we try to find out when all this stuff will be available; no one will be pinned-down (are we surprised?) but the months that kept coming up were May/June for the **C-128** & **1571**, with the **LCD** about a month behind.

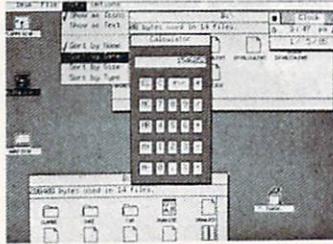
Well, I hope you enjoyed our trip to Winter CES; we'll do it again at Summer CES in Chicago this June-see you there!



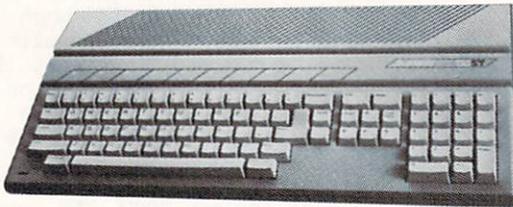
# NEWS & VIEWS

SPECIAL CES EDITION

## ATARI



A typical window-choked screen produced under the **GEM** operating system.



The **ATARI 130ST**: a lot of 'bang' for the buck.



This is what I mean by a sensible keyboard layout—on the **C-128** you have to go back to the alpha keyboard to get **⌘** and **⌘** keys.

You may be wondering how 'Uncle Jack' Tramiel (the former brains at Commodore who is responsible for the C-64 and is now the BOSS at ATARI) was taking all this hooplah from his old camp. Well, it sure wasn't lying down: J.T. and a good segment of the original Commodore staff were 20 yards away showing (true to style) a product line that must have APPLE & IBM talking to themselves. How does \$700 sound for a COLOR 128K 'Macintosh' clone with a 10-Meg hard drive? ATARI calls it the 130ST (a 520K version, the 520ST was also shown).

With specs-to-price figures like that, you may be asking yourself why you don't just forget Commodore (the C-128 notwithstanding) and put your money down on one of the ST's? I've got a couple of reasons for you:

First of all, it is still not at all certain that ATARI can even survive long enough to bring these products to market—The media is constantly relating various money, political and legal woes that continue to plague the post-Tramiel company.

Second, even should ATARI stay solvent, there is Jack Tramiel's legendary image to overcome of a man who makes promises easily, and keeps them with difficulty. This anxiety was not alleviated by his staff at C.E.S. when they would not let anyone touch the demo units that were set up (and stories abounding about technicians up all the night before still wire-wrapping the innards and patching-in segments of unfinished software so that there would be something to show at the show!)

Third, our subscription-card questionnaires have revealed that the average amount spent by our subscribers on C-64 products in 1984 alone was \$1,500! Why should you dump that kind of investment to buy-in to a big question-mark like ATARI when you can get a C-128 for \$300, give the C-64 to the kids, keep using your favorite products, and spend selectively on the 128 and CP/M products that you really want?

Fourth, if DEC's GEM operating system (which makes the ST so 'Mac-like') catches on via the ATARI machines, it is highly likely that GEM will be ported-over to other machines (an IBM version is already thought to be in development) and the C-128 could end up running in 4 modes instead of 3! (of course, you wouldn't run as fast or with the same graphics resolution, but co-processors and virtual screens could take care of that.)

Lastly, I wouldn't buy an ATARI ST even if they were on the shelves now until I see Commodore's 32-bit 'AMIGA-MACHINE'. Commodore wasn't saying a peep about it, but the expectation now is that the Lorraine (as it is also known) will be shown at Chicago in June. Judging even by the features shown a year ago on a prototype, the Lorraine will out-perform the ATARI machines in a number of significant ways.

Continued on pg. 57

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## DECODE-64

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## INSIDE THE VIC

This book was written as a machine language programmer's guide to the VIC-20. It has the complete inside story on the VIC's graphics, sound and internal ROM routines. It is also a tutorial on machine language programming, providing the clearest, best illustrated explanation of this arcane subject.

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## 64 ROMS

This is a complete listing of the programs in the ROMs of the 64. It is heavily commented, labeled and completely cross-referenced. This is an indispensable tool for the person who wants to get into the operating system of the 64. You can find all the neat routines to do just what you want. The 64 has the nice capability of allowing you to modify the operating system by making a copy of it in RAM and disconnecting the ROM. With this book you can now consider making a customized operating system, tailored for your particular needs.

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# IS THERE A

# WORLD DRIVE

## IN YOUR FUTURE ?

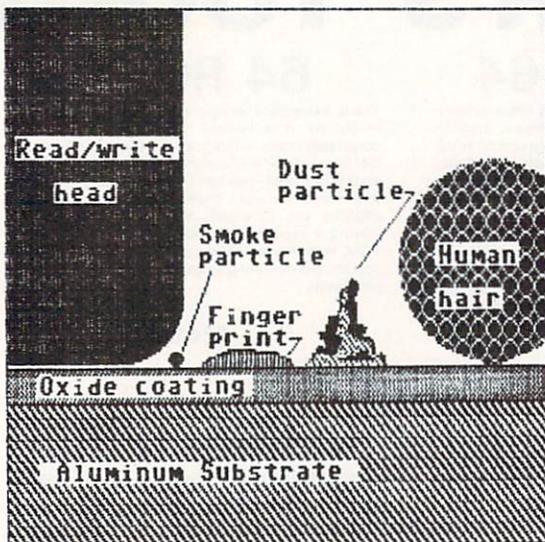
**DON VANDEVENTER** visits a company that hopes so...

Ask a Commodore 64 owner what their biggest complaint is about his or her computer system, and you will probably be told that it's the 1541 Disk Drive. The reasons for this common complaint are many; beginning with its slow access speed and ranging on down the line to problems with overheating, not enough memory and head alignment.

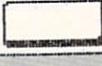
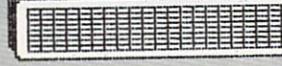
All of this may change for some computerist, if Roy Southwick and Lloyd Sponenburgh have their way. They have been working for the last year on an operating system for a 10 megabyte hard drive.

Before I go any further, it might help to look at the different ways we now have for storing information. With the Commodore 64 information can be stored on either cassette tape or floppy disk.

The tape is a plastic ribbon coated on one side with an iron-oxide material that can be magnetized. Data is recorded by electromagnetic pulses on the iron-oxide side of the tape, in much the same manner as music is recorded with a tape recorder. The data on the tape can be reloaded in the computer many times. In addition, the cassette tape can be erased and reused. The advantages to this media are its low costs and its ability to store great amounts of data. The disadvantages include its very slow speed and its sequential format of recording data. That is, the tape moves across the tape head in one direction a little at a time.



**FIG. 1:** Comparative sizes of some common contaminants in the world of a hard drive: clearly, 'big' & 'small' are relative terms here!



**Comparative Loading Times  
for a 25K program.**

Datasette.....	660	Seconds
1541 disk drive....	70	Seconds
1541 w/speed kit...	20	Seconds
Hard drive.....	1	Second

"...on a 10 Megabyte drive,  
you could store "MONOPOLE"  
over 390 times. This is  
equal to about 60 disks."

The read/write head travels  
at speeds comparable to an  
airplane flying 600 m.p.h.  
at an altitude of 1/4 inch!

The next media for storing data is the floppy disk. The disk is also made of plastic and covered with a iron-oxide material and enclosed in a sleeve. In many ways the storage of information is the same on a disk as it is on a tape. The advantages are that the disk may be rotated at very high speeds (300 rpm), and that the head can be moved to any point on the disk to read information. As a result, access time is greatly decreased. Yet, on the Commodore, the speed is still very slow as the information is moving from the disk drive to the computer or from the computer to drive in serial format. Each character is made up of 8 bits. When this information is transferred in serial format, only one bit at a time is transferred to the computer. A parallel unit would transfer this information as 8 bits, or one byte, at a time.

Several companies have tried to create products to increase the rate of transfer of information to and from the disk drive. Some of these products include the 1541 Express from Richvale Telecommunications and the 1541 Flash from Skyles Electronics. Both units can increase the speed of data transfer by as much as 4 times.

A good example of the differences in loading time is the 25K public domain program, 'Monopole'. With the Data Cassette, this program takes about 11 minutes to load. On a standard 1541 Disk Drive, it takes a full 70 seconds and, using one of the speed up units that I mentioned, the time to load is about 20 seconds. On the new hard drive, 'Monopole' will load in just ONE SECOND.

Another nice feature of a hard drive is that the amount of memory is greatly increased. On a 1541 Disk Drive, only six 25K programs can be stored on a single disk. However, on a 10 megabyte drive, you could store 'Monopole' over 390 times. This is equal to about 60 disks.

The hard drive is much like a standard disk drive except that the disk is made out of aluminum instead of plastic. The read/write head, instead of resting right on the disk, floats on a cushion of air, 20 millionths of an inch above the disk. This air space is so small that a smoke particle can't begin to fit in the space between the disk and the head. (See figure 1) As a result, the hard drive must be sealed to prevent any type of contaminate to enter the drive.

The disk in a hard drive also rotates at a much higher speed than a 1541. As the disk rotates at 3600 rpm, the read/write head travels over the disk at speeds of over 100 miles an hour. This is comparable to an airplane flying 600 miles per hour around the circumference of a lake at an altitude of 1/4 inch. The high speed of both the drive and the read/write head increases the data transfer to and from the computer.

Another major difference in a hard drive to a standard disk drive is that more than one disk and more than one read/write head will be found. The 10 megabyte drive that Roy and Lloyd are working on has 2 separate disks with 4 read/write heads to be able to read both sides of the disks. Larger drives of up to 80 megabytes will also be available.



# HARD DRIVE

CONTINUED

"FISCAL INFORMATION was obviously not the ma and pa operation that I had first expected to find."

To find an operating system that would let the computer and the drive operate together was not an easy task

I first heard about the hard drive for the C64 when I was invited to a local users group demonstration in Daytona Beach, FL. This demonstration was presented by Roy Southwick and Lloyd Sponenburgh of Fiscal Information Inc. This was such a major event that Run magazine send Margaret Morabito, Commodore send Pete Baczor, and even Jim Butterfield came down from Toronto, Canada.

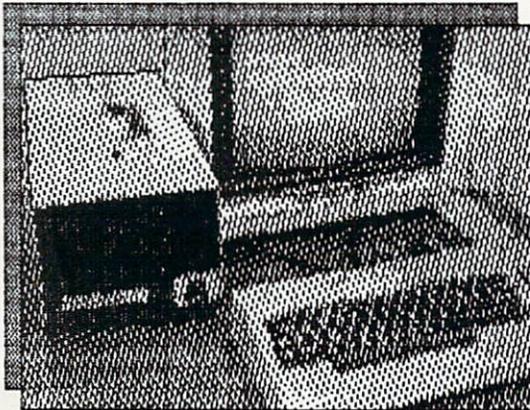
The demo presented that evening was so impressive that I spoke with Roy Southwick and asked if I could do a review for Info 64 magazine. Arrangements were made and, just after the holidays, I traveled to Daytona to the company headquarters of Fiscal Information, Inc. I must admit that I was not prepared for the company itself. I don't know what I expected, but when I stepped out of the elevator onto the 3rd floor, the first thing I saw was an architects drawing of the new company headquarters. Later in the day, I learned that the entire company would be moving into this 17,000 square foot building in March of this year. Fiscal Information was obviously not the ma and pa operation that I had first expected to find. In fact, Fiscal Information is a large company with over 100 employees and offices in 3 states.

The company was started by Bill Walter in 1971. Bill had been a professor at the University of Florida when he designed a complete software package for a few physician friends. From there, the company quickly grew to providing complete turn key computer systems for doctors' offices, clinics, and hospitals across the country. These systems range from a mere \$30,000 to a quarter of a million dollars for a large hospital.

Roy Southwick was the first employee of the company and is now Vice-President of Systems Engineering. Lloyd Sponenburgh was the 3rd employee and is now Director of Hardware Development. With their background in large computer systems, designing both software and hardware, they were able to bring to the hard drive idea experience as well as strong company support.

The idea of a hard drive started because Roy had bought a C64 for his children. As he began to personally use his Commodore, he was impressed with its power yet dismayed by the slow 1541. After all, he was used to a hard drive system. What began as a simple question "can we interface a hard drive to the C64" has resulted in hundreds of man hours, and thousands of trial and error programs to make that connection that even Commodore gave up on.

With his friend Lloyd, Roy began looking at the inner workings of the Commodore to find an operating system that would let the computer and the drive operate together. This was not an easy task.



FI's 10-Meg hard drive is about the same size as an MSD dual drive (on the outside only!)

You may not be able to save your copy-protected software to the hard drive.

It requires a physical electronic system that is capable of talking to a hard drive. The high speed of the drive itself caused the major problem. It takes a very intelligent, external system to control the heads. The SASI interface is used and from there it required designing a program with the necessary hooks to connect both computer and drive together. Now both drive and computer are able to use a standard data exchange format and yet they have lost no memory in the Commodore itself. Even more importantly they have not lost any compatibility. They have even been able to correct some of the problems of the C64 and 1541 operating system.

Does it work? Yes, well enough that several software companies are considering making a version of their programs available to be included on the hard drive when it is ready for market. Even Commodore itself has gotten into the act, inviting Roy and Lloyd to bring their hard drive to the West Coast Commodore Show in San Francisco, earlier this month. Over 6000 show attendants had the opportunity to see the hard drive demonstrated.

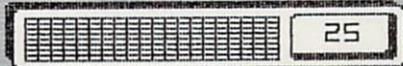
Are there any problems in using a hard drive? Yes! For example you may not be able to save your copy protected software to the hard drive. As a result, you will still need to use the 1541 Disk Drive to load your program. The hard drive can be used for your data. In most cases this is not a major problem. However using a program that requires a lot of disk access to the original program, such as 64 Accounting, will cause you to lose most of your speed advantage. Other problems include the need to make backups of your information. Fiscal Information's hard drive will have a high speed tape permitting fast coping of files. However this will really need to be done often if you are going to be adding and deleting a lot of material from your files. One last point to take in to consideration, is maintenance on a hard drive. Will there be any problems with head alinement for example. All of these problems can be easily handled, but need to be considered before rushing out with your order.

But, enough of this technical talk. It really comes down to how practical is it for you and I. Well, they are talking about a price tag of less than \$1500. Sound a little steep? Look at the price of say a MSD dual drive, about (\$695), plus an IEEE interface such as the Buscard II at about \$150.

After all that expense you still have no more storage capacity than a 1541, and only 2 to 3 times the speed. With the hard drive you are looking at 30 times the storage, and 40 times the speed.

There are some really good programs for the C64. The draw back for small business use has been the storage problem, in terms of both speed and capacity. This April, Fiscal Information will release what they feel is the answer to both problems.

(For more information about the 10 megabyte hard drive contact: Fiscal Information, Inc., P.O. Box 10270, Daytona Beach, FL 32020)

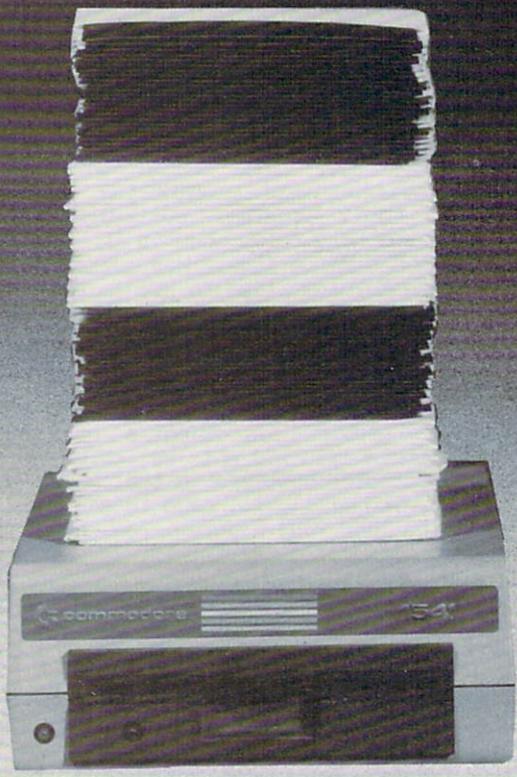


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TWX: 9109971314

# THE WORD PROCESSOR

Review by: MARK BROWN

THE WORD PROCESSOR IS VERY DIFFERENT FROM ORDINARY WORD PROCESSORS, BECAUSE ITS PURPOSE IS NOT JUST TO PROCESS WORDS, BUT TO PROCESS 'THE WORD'. THE WORD OF GOD, THAT IS. THIS PACKAGE CONSISTS OF A SOPHISTICATED SEARCH AND DISPLAY PROGRAM AND THE ENTIRE KING JAMES TEXT OF THE BIBLE ON EIGHT DISKS. AT \$199.95 IT'S NOT CHEAP, BUT IT IS WORTH THE MONEY.

THE WORD PROCESSOR WAS FIRST DEVELOPED FOR THE APPLE, AND HAS BEEN TRANSLATED FOR THE IBM, CP/M MACHINES, AND NOW THE COMMODORE 64. THE BIBLICAL TEXT WAS ORIGINALLY DOWNLOADED FROM A COMPUTER TYPESETTER, AND THUS DOES NOT SUFFER FROM ANY OF THE ERRORS THAT MIGHT HAVE BEEN INTRODUCED THROUGH RETYPING. THE WHOLE TEXT WAS THEN PASSED THROUGH A COMPLEX TEXT COMPRESSION ALGORITHM, WHICH IS WHY THE WHOLE 4.5 MILLION CHARACTERS OF THE BIBLE CAN FIT ON ONLY EIGHT DISKS.

THE WORD PROCESSOR PROGRAM STARTS OUT WITH A MENU OF OPTIONS WHICH SETS UP FOR YOUR PARTICULAR HARDWARE CONFIGURATION. THE SETUP CAN BE SAVED TO DISK AND FORGOTTEN ABOUT THEREAFTER OR CHANGED AT ANY TIME. BASICALLY, THE PROGRAM GIVES YOU THE OPPORTUNITY TO DISPLAY AND READ BIBLICAL PASSAGES (A MINOR FUNCTION), DUMP SELECTED VERSES TO THE PRINTER (SOMEWHAT MORE USEFUL), AND PRODUCE INDEXES BY KEYWORD SEARCHES. THIS IS THE REAL POWER OF THE WORD PROCESSOR. YOU CAN PRODUCE AN INDEX BY FIRST DEFINING THE RANGE OF TEXT YOU WANT TO SEARCH, SUCH AS JUST THE GOSPEL OF JOHN, OR ALL THE BOOKS OF THE OLD TESTAMENT. YOU THEN ENTER A WORD OR PHRASE, OR A LIST OF WORDS AND PHRASES THAT YOU WANT TO SERVE AS KEYWORDS FOR YOUR INDEX. YOU THEN SIT BACK AND WAIT FOR THE SEARCH TO COMPLETE. THE ONLY WORK REQUIRED OF YOU WILL BE IF YOUR SEARCH PASSES ON INTO TEXT CONTAINED ON A DIFFERENT DISK THAN THE ONE IN THE DRIVE, IN WHICH CASE YOU WILL BE PROMPTED TO SWITCH DISKS. WHEN THE SEARCH IS COMPLETED, THE INDEX REFERENCES WILL BE DISPLAYED. YOU CAN THEN REVIEW THE TEXT ASSOCIATED WITH THE VERSES REFERENCED, AND ADD OR DELETE REFERENCES MANUALLY IF YOU WISH. WHEN YOU ARE DONE WITH THIS REVIEW, YOU CAN SAVE THE INDEX TO DISK.

ONCE YOU HAVE BUILT UP A USEFUL LIBRARY OF INDEXES, YOU MIGHT WANT TO CONSOLIDATE SOME OF THEM. THIS IS EASILY DONE THROUGH THE MERGE OPTION. YOU CAN MERGE INDEXES TOGETHER INCLUSIVELY, OR SO THAT ONLY VERSES REFERENCED BY BOTH ARE INCLUDED IN THE RESULTING INDEX. YOU MAY ALSO CREATE INDEXES MANUALLY IF YOU WANT TO DO TOPICAL STUDIES RATHER THAN KEYWORD SEARCHES. BIBLE RESEARCH SYSTEMS HAS AN AUXILIARY DISK FULL OF 200 SUCH TOPICAL INDEXES AVAILABLE FOR AN ADDITIONAL \$49.95.

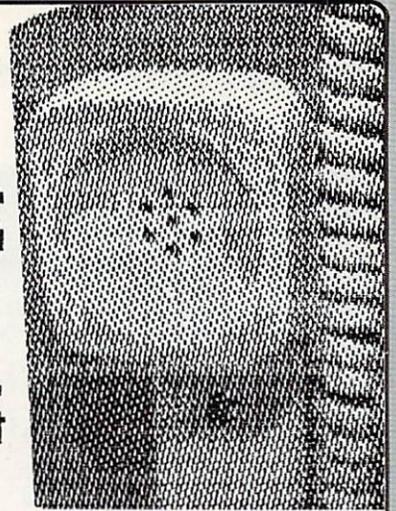
This package consists of a sophisticated search & display program and the entire King James text of THE BIBLE on 8 disks (4.5 million characters!)

THE WORD PROCESSOR IS WRITTEN IN BASIC, SO I WAS AMAZED AT HOW QUICKLY IT COMPLETED ITS SEARCHES. THE CODE MUST BE VERY EFFICIENT. THE ONLY REAL DISAPPOINTMENTS I HAD WERE ITS INABILITY TO PRODUCE WORD-PROCESSOR COMPATIBLE TEXT FILES ON DISK (THOUGH IT MIGHT BE POSSIBLE TO ADD THIS FEATURE, BECAUSE OF THE BASIC CODE), AND THE FACT THAT INCLUSIVE INDEXES CANNOT BE PRODUCED DIRECTLY, BUT ONLY BY MERGING TWO SEPARATE INDEXES. HOWEVER, THESE ARE MINOR FLAWS IN AN OTHERWISE SUPURB PROGRAM. I STRONGLY URGE SOFTWARE MANUFACTURERS TO CONSIDER PRODUCING MORE VARIED SOFTWARE THAT MEETS THE UNIQUE NEEDS OF REAL PEOPLE, AS THE WORD PROCESSOR DOES FOR SERIOUS BIBLE STUDENTS.

BIBLE RESEARCH SYSTEMS  
PO BOX 1389  
ROUND ROCK, TX 78680  
(512) 835-7981



# LET YOUR FINGERS DO THE TALKING



A Guide to Telecomputing 1985 **by Peggy Herrington**

**T**elecomputing - the linking of computers via telephone - has spawned a network so vast, so multi-faceted that the end now justifies the means: people use personal computers exclusively for networking. The growth of the industry can be directly attributed to the popularity of the machine it feeds - or feeds upon, depending on your point of view - but the technology is not as new as you might imagine.

**ARPANET**, the Department of Defense-sponsored network burglarized recently by a teenager with a **VIC**, is the oldest and largest network. Technology developed for it in the late 60's is still in use on most networks today. Long before the general public knew - or cared - about computers, **ARPANET** users (Pentagon-approved scientists) were using spelling checkers and holding hobby club meetings on-line. Of course, they weren't riding the wires with personal computers. Printers functioned then as monitors do today and output keyboards ("terminals") sent their data to the mainframe at the other end of the line. That's why telecommunications programs for personal computers are referred to as "terminal" programs.

You don't need government approval to telecompute today (**ARPANET** notwithstanding) and the extent of telecommunications must astonish the people who developed the technology that made it possible. With a properly equipped computer, you can chat with a dozen or more '64 users at once or ask the **CBM** Hotline why your printer won't underline, get advice from a vet on the Goat-herders **SIG** (Special Interest Group), check schedules, fares and make airline reservations - or file your own flight plan, meet your future spouse masquerading as Boy George on a **CB** simulator, look up something in an encyclopedia, download programs or take programming lessons, see how your stock is doing, order IRS publications, buy things from Sears and other retailers or write a chapter in an interactive on-line novel.

Silly or serious, these and a zillion other activities are at your fingertips. Telecomputing is even practical now for people with impaired vision with a voice synthesizer (**Genesis Computer Co.**) and a special version of **Smart 64** (**Microtechnic Solutions**) which will enunciate every word coming in and going out.

There are four categories of things you can do on-line: 1) gather facts and news, 2) purchase services or merchandise, 3) download (receive) public domain computer programs, and 4) "talk" with computers that wouldn't otherwise "understand" you.

1		5	
	Mail. Bulletin Board. Customer Service		Advice. Fitness. Calorie Counter
2		6	
	Advice. Pets. Garden. Fashion		Parks. Beaches. U.S. Travel. Airlines
3		7	
	Reviews. Tickets. Best Bets		Library Services. Encyclopedia
4		8	
	Recipes and Restaurant		Buy and Sell on Viewtron
1	VIEWTRON		

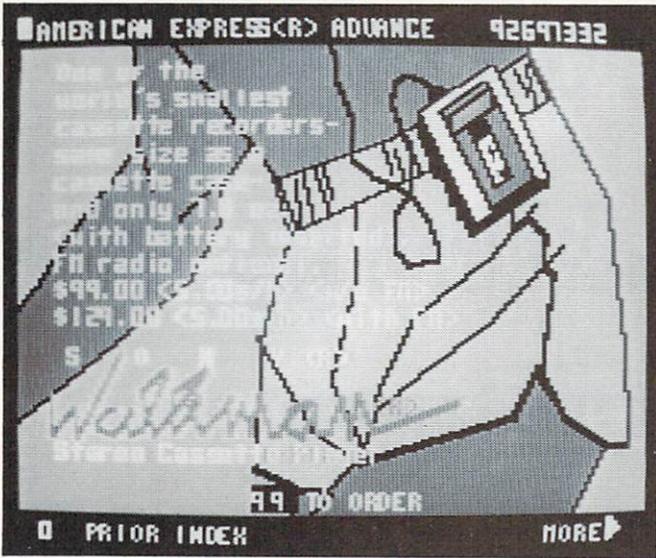
## VIEWTRON INDEX

### VIDEOTEX

Computers communicate with **ASCII** (American Standard Code for Information Interchange), common numerical values for numbers, letters and punctuation. But since **ASCII** deals with text-related code only, telecomputing has been limited to word-oriented exchanges. (Only player input for games with graphics displays are handled by a network; the games are loaded from disks you buy in advance.) But hold the phone! Telidon, a Canadian **VIDEOTEX** system has come up with a code called **NAPLPS** (North American Presentation Level Protocol Syntax) that may do for computer graphics what **ASCII** did for text.

Photos by: **PAT HERRINGTON**





**NAPLPS (SAY 'NAP-LIPS') GRAPHICS**

Although the resolution on my 1702 monitor wasn't as high nor the graphics as elaborate as photos I've seen of Sceptre displays, the overall quality was such an improvement over the plain text other networks send, it seemed like using a different medium: perhaps a glimpse of color TV when you've only known radio. Despite a glitch in the software that let text print over text (remember, it's still under development) and my on-line horoscope predicting my activities that day would be unique rather than profitable, I was impressed.



**COMPUERVE C-64 GRAPHICS SCREEN**

NAPLPS is a VIDEOTEX protocol (or set of rules) for creating, storing and transmitting computer graphics with ASCII text. It isn't on a nationwide network yet but several U.S. companies (AT&T and CBS for starters) are involved in NAPLPS VIDEOTEX projects. Regional networks use it but as of this writing they can only be accessed by memory-rich AT&T Sceptre terminals. But the race to produce NAPLPS software is on. (Commodore announced it for the '64 last summer and keeping true to form, has been silent on the subject ever since.)

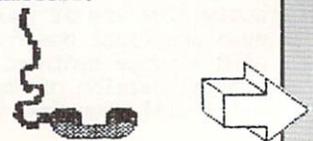
TELECOMPUTING HOST SYSTEMS

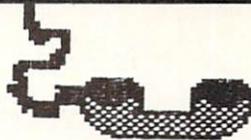
But... with Jordan software (cartridge, \$99) soon to be released by Addison Information Systems (formerly Avcor), my Commodore 64 and I accessed Viewtron, a southern Florida regional NAPLPS network owned by Knight-Ridder Newspapers (1-800-272-5400.) Viewtron offers just about everything an information network can: entertainment info (local night life reviews and reservations, movies, park and beach activities), food and dining (restaurant menus, recipes, even delivered groceries), regional news and sports, investment services, live conversation or messages, games, and services and merchandise - if you can't buy it on Viewtron it's probably not worth having.

Your '64 can communicate directly with any CBM computer once you're both equipped for telecommunications. It's easiest when both computers use the same terminal software but the novelty soon wears off.

The variety of text and illustrations on hi-resolution, multi-color screens from Viewtron was stunning. I watched them build, layer by layer, on my monitor - a relatively slow process compared to a text-only display, which has not been well-received in VIDEOTEX market tests on other networks. At the transmission rate of 300 bits per second (bps) used by most modems for personal computers now, it's pretty slow; you're very aware that you're being charged by the minute. But modems that handle 1200 bps are dropping in price and at that speed - four times faster - it shouldn't be a problem.

Private Bulletin Board Systems (BBS's) are more stimulating. A computer store or user group will have the phone number for a BBS if there's one in your area. They are often hobby "boards" run on someone's home computer and can be accessed by anyone with the phone number. Numbers for other BBS's are often available on any one of them. There are thousands of BBS's across the country which you can access for the cost of a long distance phone call. Occasionally you'll find one that charges a membership fee. Either way, they come in two flavors as far as we're concerned, CBM and non-CBM host systems. On the latter, you can "talk" with all brands of computers, not just Commodore.





The real action, however, takes place later in the night on an information service (a commercial network). Join one and you'll never have to be alone again: hundreds of personal computers - from anywhere in the world - can be hosted at the same time by these mainframes. But watch out: it's easy to get hooked and can quickly become expensive; I have the bills to prove it. There's a fee to join and you're charged for the time you're "on-line" or actually connected to the network. You don't incur long distance telephone charges to reach a network if you live in a fair-sized city since a local access number (Telenet or Tymnet) connects you directly to the mainframe.

```

Accession: Bill P1, Les J, Ruth G1
Joseph D, Daniel O, Darlene S, Jeanie C *
Message From: Bill P1
Hi Peggy,
Do you want me to send you mail that
you could take a picture of?
Love,
E Pi E
End of Message - Press F5 to cancel

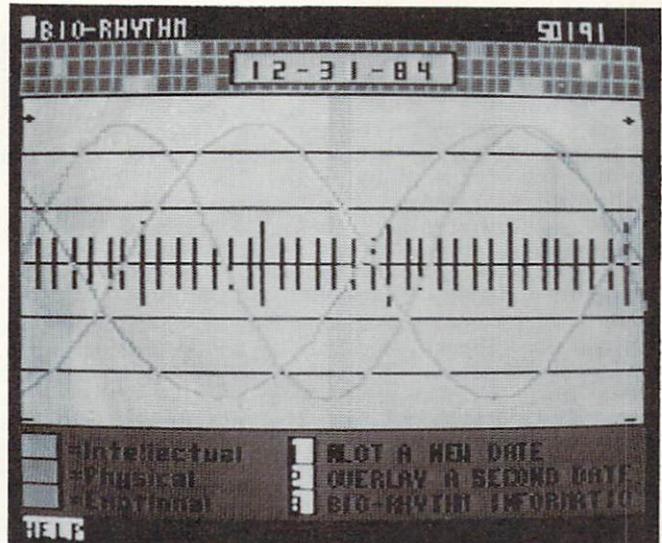
Bill P1 All right Randy!!!!
Andy D your signed up!
Peggy H Really, I'm gonna take a
screen shot for the INFO 64
article. OK?
Daniel O sure
Jeanie C why not?
Daniel O hMMMMM
here goes!!!!
    
```

**ELECTRONIC RAPPIN' TRANSCENDS  
AGE, SEX, & RACE BARRIERS.  
PERSONALITY & TYPING SPEED  
ARE YOUR ONLY LIMITATIONS.**

#### YOUR SYSTEM CONFIGURATION

Along with a computer and monitor or TV, you'll probably want a disk drive; tape is severely limiting. Besides a modem (which we'll get to in a moment) you must have a modular telephone with a hand set that unplugs from the dialing mechanism: an old desk model.

A modem is an RS-232C device which **MOD**ulates computer digital bit streams into audible pulses (that telephone lines can carry) and **DEM**odulates pulses when they're received. There are three types for the '64: 1) a manual modem like the 1600 Vicmodem requires that you dial the number and plug the line from the phone base into the modem; 2) the programmable or automatic type like the 1650 Vicmodem that dial for you (some programs make the modem redial periodically on a busy signal, or answer incoming calls); and 3) the intelligent or "smart" kind which house ROM chips and do everything an auto modem can and then some.



The modem determines the speed at which data are transmitted, measured in bits per second or Baud rate, the standard today being 300 bps. Transmitting data faster can reduce your connect time (although commercial networks know it and charge more for transmissions over 300 bps). Only a smart modem can handle more than 300 bps on the '64. Commodore announced a 1200 bps modem for the C-128 in January but it won't work with the '64.

Buy a modem before joining a commercial network; free time and/or discounts sometimes come with them. If you already have a modem, consider a network "starter kit."

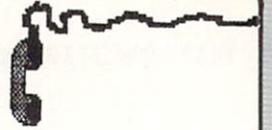
#### PROTOCOLS

Terminal software determines what you can - or can't - do on-line. It shuts out BASIC and makes your computer emulate a terminal. Using it is like using a word processor except for the fact that there's a telephone line within the system. Stray noises on the phone line will corrupt data in transit. This isn't important when you're "talking" with another computer user who can overlook an error here or there but conversation isn't the only thing sent over phone lines. Programs can get messed up and, as you probably know all too well, one error is all it takes.

Several ways of making sure precisely what was sent got there, called "error checking protocols," are in use and each method was designed for a particular host computer. The error checking protocol in the program running on your '64 must match that used by the host system you want to access. Three protocols predominate: 1) **CBM-Punter**, developed by **Steve Punter**, used on BBS's hosted by Commodore computers; 2) **Xmodem**, developed by **Ward Christianson**, used on non-Commodore host systems and sometimes used with **Xon/Xoff protocol** (also called **GO/HALT**) to pause and restart transmission; and 3) the **"B"** protocols used on **CompuServe**.



## TELECOMPUTING continued...



Each host system uses its own - and only its own - protocol. A single terminal program for the '64 can (and should) offer more than one of them. It's up to you to get and use the right one with the right host. If everything isn't exactly right, you'll miss out on one of the primary reasons for telecomputing - downloading programs which belong to no one and everyone (by virtue of being in the public domain) and cover everything from business to games - literally every area of interest a program can be written for.

Terminal software also controls adjustable communications parameters like duplex, parity, stop bits and word length, and this is where you can start getting overwhelmed. You don't have to know what these things do: just make sure you use the same error checking protocol as the host you want to access and the default values will (almost always) work for all this other stuff. If one of the settings is off, you'll know it. For instance, if duplex is wrong, either you won't be able to see what you type or yyouurr tteexxtt wwiill llookk lliikkee tthhiiss

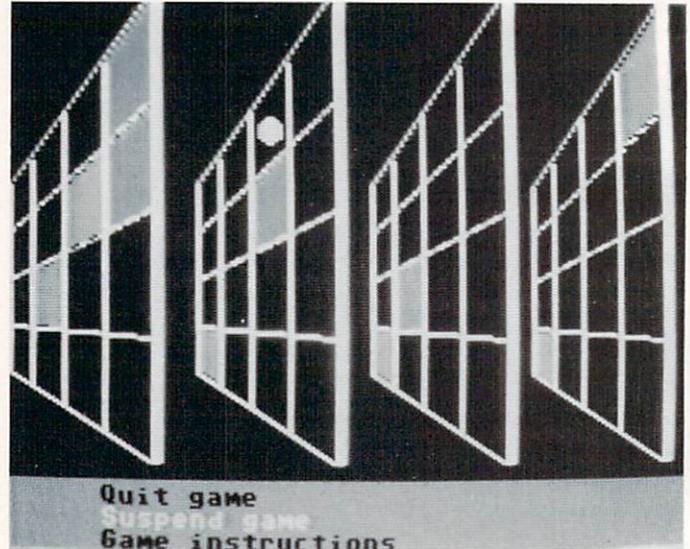
### TERMINAL SOFTWARE

Many things besides protocols make for a good terminal program. Comments on several of them follow but they have some common features. Using your disk drive when you're on-line is important: you might need to format a disk. All programs mentioned here offer full disk access from terminal mode. They all let you change text, border and screen colors and all have programmable function keys. All will let you save to disk OR printer. All except **HomeTerm** offer full control of communication parameters. All automatically translate **CBM-ASCII** to true **ASCII** and will operate with manual or autodial modems. Word-wrap is available in all except the special **COMvoice** version of **Smart 64**. **VIDTEX** is the only one without an on-screen clock to help you keep track of time on-line.

The size of the program's memory buffer is important, unless it offers **virtual memory**. When you're on-line, information on the screen is gone unless you took steps to save it before it arrived. You save it in a buffer which can hold only so much. When it's full, you "dump" it to disk or printer. A big buffer means you have to do this less frequently and seldom need to merge a program you saved in two parts. With **virtual memory**, you can save information directly to disk or printer as it comes to you. **VIP** and **Smart 64** have **virtual memory**.

All of these programs will let you download from commercial networks. **VIP**, **SuperTerm**, **Smart 64** and **FirstTerm** will download all types of program files - but that's just the first step. Before a program can be transmitted it must be converted to a text file. In that form it's like a listing on paper even though it may appear on the screen. No, you don't have to type it in but you do have to convert it with an off line utility program which tokenizes it and makes it "runnable." These programs provide the utilities to do this but it's a hassle because you can't convert a program while you're on-line. You have to save it, sign off the network and load in the utility.

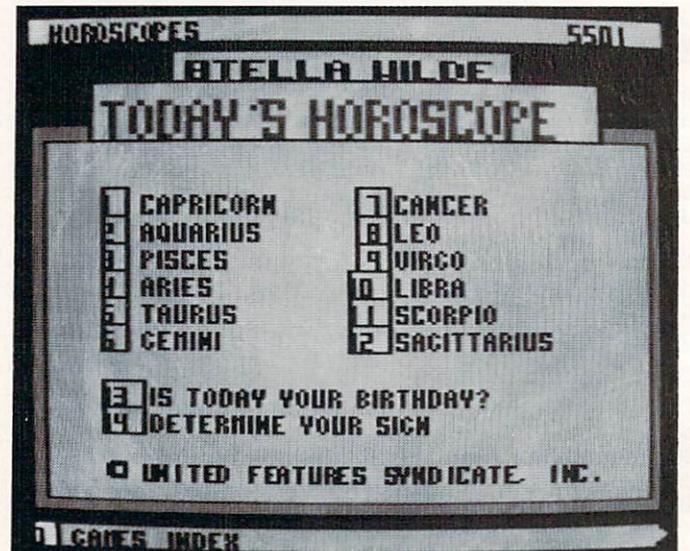
The two exceptions for downloading from commercial networks are **HomeTerm** and **VIDTEX**, and they function at opposite extremes. Some files on **CompuServe** have **.IMG** extensions on their names which indicate they are programs for a specific kind of computer (like



A hot game of **QUAD 4** in progress on **PLAYNET**

the '64). **HomeTerm** won't touch **.IMG** files - you can't download them with it no matter what. **VIDTEX** will download not only **.IMG** files but all **CompuServe** files and convert program text files to tokenized programs transparently. No off line conversions are needed - **VIDTEX** does it automatically.

Three of these programs will access both networks (non-CBM hosts) and BBS'S (CBM-hosts): **VIP Terminal**, **SuperTerm** and **FirstTerm**. Program conversion is done by the terminal program on a **CBM-Punter** BBS. You never have to fool with it.



TELECOMPUTING continued..

**VIDTEX** (\$39.95 from **CompuServe**) lacks many snappy features and doesn't have **CBM-Punter** protocols but it's far and away the best way to access **CompuServe**. The documentation is weak and you must list **VIDTEX** to change screen colors or communication parameters but you never have to mess with converting files and, of course, it will handle **.IMG** and **64** graphics. Built-in text editor and 32K buffer.

**HOMETERM** (**HomePak** \$49.95 from **Batteries Included**). **HomePak** is three interactive programs on one disk (terminal software, word processor and data base) which sounds good, but **HomeTerm** has some serious limitations. It does not download from a **CBM Punter** host, and will not deal with **CompuServe's .IMG** files although it will handle the others. There's a tiny 12K buffer. The documentation is **HomeTerm's** best feature.

### COMMERCIAL NETWORKS

Information services, as they prefer to be called, have membership fees and charge for the time you're on-line. Most provide daytime business services and offer reduced rates for "non-prime time" or evening use from 6PM (your time) to the wee hours on weekdays, 24 hours a day on weekends and holidays.

**CompuServe** is the largest **Commodore**-oriented network in the world, probably because it has the **Commodore Information Network**, **Commodore Business Machines'** own information service. Other networks have good recreational features in general but if you're into **Commodore** computing, **CompuServe** is THE place to be. There are hundreds of other Special Interest Groups (**SIGs**) including a **CB** simulator. Free time on **CompuServe** often comes with many modems or starter kits: don't waste it reading menus! At any on-line prompt type **GO CBM** and then join the **SIG** of your choice: **VIC**, **'64**, **PET** or **The Creative Corner**. It doesn't cost extra. Once there, follow the menus. Read the bulletins and a few messages and then see if you can strike up a conversation with people in the live conference area ("**CO**"). It's a group phone call in writing, the text scrolling up and off your screen as talk proceeds. If you're lucky, one of the **SYSOPs** (**SYSTEM OPERATORS** - many of whom are not **CBM** employees) will be on **CO**. You can ask them for help navigating the system. Get out of **CO** by typing **/exit**.

Leave a message for me if you wish in the **'64 SIG** or in **EMAIL**. My ID# is 74475,160 and I'll respond. Or leave a technical question about **Commodore** problems on the **CBM Hotline**. Don't forget to look through the subject index to the data bases. They contain thousands of public domain programs (including the series **CBM** sells) which you can download, including music and **64** graphics in **The Creative Corner**.

**CompuServe** charges \$35 a year membership and \$6.00 an hour connect time. For more info call 1-800-848-8199.

**THE SOURCE** and **DOW JONES/NEWS RETRIEVAL** are extensive commercial networks and are a lot like **CompuServe** except for the absence of the **Commodore Information Network**. The **SOURCE** charges \$49.95 to join plus a \$10 monthly service charge and \$7.75 per hour connect fee. 1-800-336-3366. **DJ/NR** charges a one-time start up fee of \$75 plus \$.20 a minute connect charge (that's \$12.00 an hour!). Call them at 1-800-257-5114.

### THE LINE UP

**VIP TERMINAL** (\$59.95 from **Softlaw**) includes **CBM-Punter** and non-**CBM** protocols and may be the only terminal program you'll ever need. It's easy to master and characters per screen line can be set to 40, 64, 80 or 106 without extra hardware. It has an adequate built-in text editor and virtual memory. You can toggle on-screen help in terminal mode and it has a separate collection of utility programs. Excellent documentation with even more instructions on the disk itself which you can read on the screen or print out.



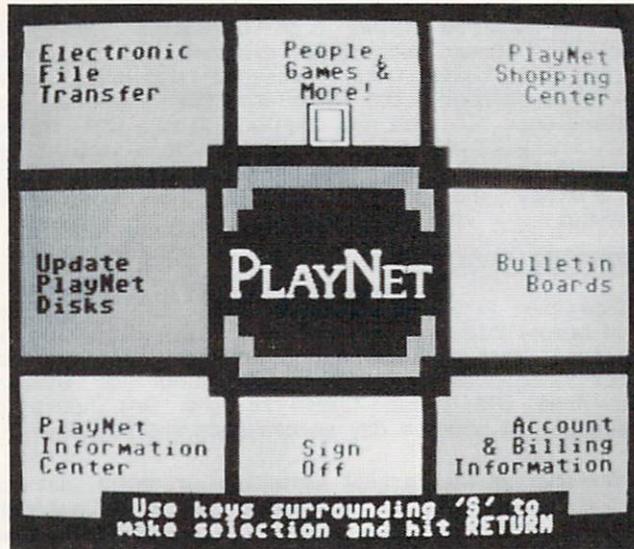
### VIP TERMINAL FUNCTION-KEY ICONS

**FIRSTTERM** (Free from the public domain) was written by **Tom Hughes** and accesses both non-**CBM** and **CBM-Punter** hosts. It handles all **CompuServe** files including **.IMG** and does conversions. Full screen editing and a 32K memory buffer. Documentation is in a separate file you can read on screen or print out. 40 column display. It's not fancy - but the price is right. Available on disk from many user groups or have a friend download it from a **CBM-Punter BBS**.

**SUPER TERM** (\$89.95 from **Midwest Micro**) is for hobby and professional use. It creates only true-ASCII sequential files, has a smallish 18K memory buffer and an extensive built-in text editor. Several protocols are addressed and in addition to **CBM** and non-**CBM**. You can access the Post Office's Easy Link and business or university systems requiring DEC terminal emulation. The entire keyboard is redefinable. The 40 column screen display can be scrolled horizontally and with an optional spooler called **Sprinter** and the right printer, you can print data as it arrives. Comprehensive documentation.

**SMART 64 TERMINAL** (\$49.95 from **Microtechnic Solutions**) has non-**CBM** protocols only and a revised version works with a voice synthesizer (from **Genesis: COMvoice** retails for \$99 to \$149 depending on speaker requirements, is phoneme-based, and you can use in your own programs). **Smart 64** with **COMvoice** will clearly pronounce every word as it is transmitted either direction. 28K buffer or virtual memory but there's no resident text editor. Documentation is extensive and thorough. **Smart 64** will emulate the **DEC VT52/VT100** terminals used to access business and university systems and download **CompuServe 64** graphics.

TELECOMPUTING continued...

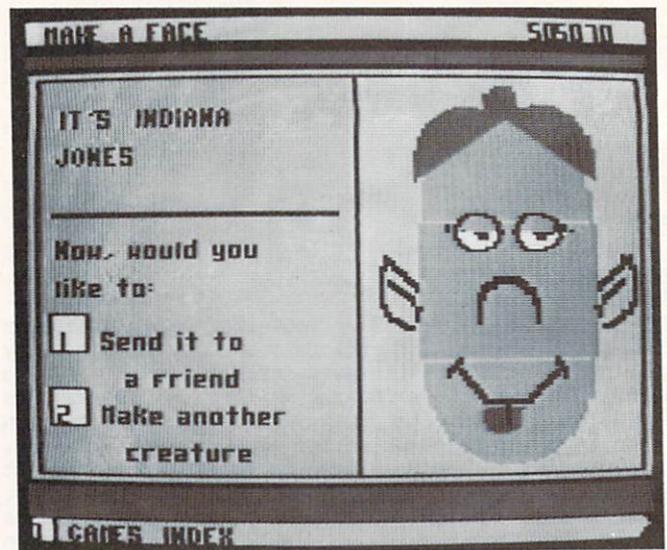


PlayNet has beautiful on-line graphics and sound - including games - but it's not videotex. Screen displays and games are loaded from one of the three disks that PlayNet provides when you join (\$34.95). You don't have to buy additional disks to play interactive games but that's only an advantage if you want to play games in the first place. (Lest I sound superior, I confess to enjoying Quad 4 on-line with 10 other players, during which game we carried on a lively -if confusing- conversation. Two of us "won.")

Getting around on PlayNet is about a million times easier than doing so on other networks but the trade-off is that it's proportionally less extensive. Even when fully operational with Apple and IBM-PC members, public domain and commercial data bases and other structures, it should have easy access. Extensive conferencing features (such as splitting the screen for private messages and menus that toggle on and off) made it delightful to talk with very enthusiastic PlayNet users like Bill P1 who stroked my ego by guessing my full name from Peggy H, my pre-designated handle, and Deb C, who's "deb!" when she runs the CBM SIG on CompuServe.

You don't need your own terminal software because it's on the disks PlayNet provides, and updates for new features are downloaded. You have to wait a couple of minutes for disk loads each time you change areas but the \$2 an hour connect fee of \$2 an hour works out to only three and a third cents a minute. Other costs are a monthly service charge and fee for downloading which averages \$.50 per file. Call 1-800-PLAYNET for more info.

AMERICAN PEOPLE/LINK is doing Beta testing as of this writing. Their ads claim "anyone with a word processor, personal computer or terminal, and a modem" can access People/Link upon, of course, paying the \$14.95 one-time sign up fee. But notice it says "word processor" - not terminal software. A lengthy and unconvincing phone conversation with them left me as skeptical as I was in the first place about



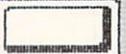
getting on-line with a word processor, even at \$2.95 an hour. Nevertheless, they spoke of interactive, multi-player games "coming soon" as well as Special Interest Clubs (SICs?) with user Club Presidents deciding everything including subject matter. Good luck when calling 1-800-524-0100 for more information.

THE ELECTRONIC UNIVERSITY is not a commercial network per se, rather it is a means of study via telecommunications. Courses range from seminars to classes for kids, professional field-specific study and adult education which many U.S. colleges accept for credit. There's conferencing and private on-line consultation with professors and 24-hour access to a library of data bases. I was impressed with the diversity (if not the number) of available classes. Call 1-800-22LEARN (1-800-44LEARN in Calif.) for info and prices.

#### GO FOR IT

If you do nothing else, downloading public domain programs is sufficient reason to telecompute. But your first try can be tough. Be sure to read (and re-read) on-line instructions and program documentation. Make certain you have the right protocols. Remember that all computers are picky devils; your patience and perseverance can be taxed but keep trying - it's worth it. Public domain programs are NOT second-rate and can be especially helpful for learning or sharpening BASIC skills because you can list and examine them. In fact, you can do anything you please with a public domain program, from personalizing it to selling.

on-line conferencing runs the gamut from technical talk to pure unadulterated fantasy. Whatever your preference, you can make friends with people you might never meet face to face, and all of them are interested in computers. If you like dealing with the written word and have fair typing ability, you're sure to find it fascinating. Keep in mind that the advantages enjoyed by good-looking people in person belong to the literate, on-line. /bye



## GUIDE TO TELECOMPUTING VENDORS

**JORDAN 1.24 NAPLPS Firmware**  
(C-64 cartridge 999)  
Addison Information Systems  
(formerly AUCOR)  
512 King St. East, 3rd floor  
Toronto, ON Canada M5A 1M1  
(416) 864-92240

**SuperTerm**  
Midwest Micro, Inc.  
311 West 72nd Street  
Kansas City, MO 64114  
(816) 333-7200

**VIEWTRON CORP. of AMERICA**  
(NAPLPS videotex network)  
1111 Lincoln Road, 7th floor  
Miami Beach, FL 33139  
(305) 674-3457

**PLAYNET, INC.**  
200 Jordan Road  
Troy, NY 12180  
(800) PLAYNET

**VIDIEX** ("Executive" is bus. pkg.)  
CompuServe, Inc.  
P.O. Box 20212  
Columbus, OH 43220  
(800) 848-8990

**HomeTerm (HomePak)**  
Batteries Included, Inc.  
17875 Sky Prk North  
Suite P  
Irvine, CA 92714  
(714) 979-0920

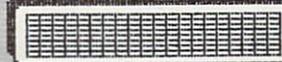
**SMART 64 TERMINAL**  
(ver. 4 w/ COMvoice)  
Microtechnic Solutions, Inc.  
P.O. Box 2940  
New Haven, CT. 05616  
(203) 389-8383

**VIP TERMINAL**  
Softlaw  
132 Aero Camino  
Goleta, CA 93117  
(805) 968-4364

**Telelearning Systems, Inc.**  
505 Beach Street  
San Francisco, CA 94133  
(415) 928-2800

**COMvoice Voice Synthesizer**  
Genesis Computer Corp.  
P.O. Box 152  
Hellertown, PA 18055  
(215) 861-0850

**FIRSTTERM (public domain)**  
Widely available thru  
user groups and BBS's



# BEARCAT



## COMPUSCAN 2100

REVIEWED BY: TED SALAMONE

**Bearcat** has been producing standard setting scanners for many years now. Reliability, technical sophistication, and user satisfaction have been the bedrock of their success. Evidence of this commitment to excellence is amply demonstrated in their newest venture, the **CompuScan/CP 2100**.

Consisting of a receiver with built in speaker, cables, antenna, power pack, operator's manual, and software, the **2100** works with a disk equipped **Commodore 64**. The scanner monitors the airwaves, the **64** manipulates the data.

This teamup provides hobbyists with a 200 channel capability arrayable in ten user selectable banks. Seven different bands can be accessed: aircraft, 70 cm or 2 meter amateur, UHF, UHF-T, and low or high VHF.

The **CompuScan** diskware, being of a friendly menu driven persuasion, permits creation of three priority channels, the inclusion of a memo pad feature for each frequency, and manual or automatic search routines which can be initiated at either the high or low end of a range.

Furthermore, auto search and store, search/scan frequency occurrence counts, automatic channel lockout, and selectable scan delay are feasible with the **Scanner1** program provided.

Another computer/scanner merger benefit is the ability to send signals to a tape recorder, alarm, or small electric appliance. Multiple antennas and other hardware can be attached, those indicated above are just some of the more common ones.

Encased in an attractive snow beige plastic and aluminum housing with two dials, (on/off volume and auto/manual squelch control), the **CompuScan** unit is rack mountable. The one reviewed had no power on light (an annoying omission), though this should have no effect on careful users. (Dis)connecting items to powered units is never a good policy, even if not specifically banned in the operator's manual.

Setup is so simple, that following the manual actually makes it more difficult. Though good line drawings are provided, the remainder of the installation instructions are less lucid. Luckily there's not much that can go wrong if a little common sense is applied.

Fortunately the balance of the manual, (tutorial, commands summary, and electronic interface data) is well illustrated, organized, and presented.

The RS-232 cable plugs into the **64**'s rightmost port from the underside of the **2100**. Located here is an interface for an external stereo hookup, though the integrated speaker works fine once the internal loop is closed. (Insertion of the provided accessory plug is needed to accomplish this.) The telescoping antenna is attached by a snap and twist coax cable connector, while the power supply fits into a male plug adjacent to the dip switches. By the way, these switches are used to set the proper baud, parity, and carriage return/line feed parameters.

Once all the connections have been made and the disk booted, the airwaves beckon. (One more word of caution, the antenna should be located as far from the **64** as possible to eliminate potential interference.)

A brief glossary of terms should suffice for any uninitiated, but curious readers. A **locked out** channel will be overlooked during scanning sessions. This is used mostly to eliminate known, but unwanted frequencies. **Delay** keeps the scanner tuned for two seconds after a signal has been lost. This is helpful where response transmissions are expected. **Count** simply refers to the number of times a signal is found during a scan cycle. All of these options can be switched on or off as needed.

One nice feature, the **Priority** option, makes **CompuScan** monitor up to three selected channels while carrying out other **scan** or **search** tasks. Approximately every two seconds a priority check is performed. If a designated station is found, the other routine is interrupted. With this, important but infrequent broadcasts can be received while others are actively pulled in.

Believe it or not, there is a difference between **scan** and **search**. The scan mode sweeps through selected banks sampling every channel that hasn't been locked out, while the search mode acts as a fine tuner across a user defined range of frequencies. For those interested in exotica, a list of **Scanner1** program files and **CP 2100** specifications is included in the manual.

Other than the poorly written setup instructions, the **2100** has no readily apparent faults. At \$499.00 list price, it shouldn't. Of course price isn't a direct reflection of value or usefulness. Here it serves to limit the number of probable owners. Many may want, far fewer will buy. That's sad too, because it is a fine piece of hardware. Interested parties should contact

Electra Co.  
300 East County Line Road  
Cumberland, Indiana 46229



# ERG-CARD™ REFERENCE CARDS

WELL, BY NOW YOU ALL HAVE YOUR ERGBOARDS, RIGHT? (NO? SEE INSIDE BACK COVER FOR DETAILS ON THE AMAZING ERGBOARD... BE THE FIRST IN YOUR USER GROUP TO OWN ONE... ORDER YOURS TODAY!) ACTUALLY YOU CAN USE THESE REFERENCE CARDS WITHOUT THE ERGBOARD (IT'S JUST

NOT AS HANDY- TAPING THEM TO YOUR MONITOR). INSTRUCTIONS: CAREFULLY REMOVE CENTERFOLD FROM STAPLES, CUT ALONG COLORED BORDERS, POSITION IN ERGBOARD REFERENCE WINDOW, USING THE ORIGINAL CARDS FOR SUPPORT (OR TAPE 'EM TO YOUR MONITOR). USE THE BLANK BACKSIDES FOR MAKING YOUR OWN REFERENCE CARDS. KEEP SENDING YOUR SUGGESTIONS FOR ERG-CARDS YOU'D LIKE TO SEE. -THE EDITOR.



## ERG-CARD™ FOR USE WITH CompuServe™

CompuServe™ is a trademark of CompuServe Incorporated.

### STANDARD COMMANDS

H # HELP  
G # GO TO PAGE #  
T # TOP MENU  
M # PREVIOUS MENU  
N # NEXT MENU TOPIC  
P # PREVIOUS MENU TOPIC  
R # RESEND PAGE  
B # BACKUP A PAGE  
S # SCROLL TO END  
S # SCROLL MENU ITEM #  
LOG RESET TO LOG-ON  
OFF DISCONNECT

### CONTROL COMMANDS

CTRL A HALTS DATA AT THE END OF LINE  
CTRL M RESTARTS OUTPUT AFTER CTRL A  
CTRL S STOPS DATA, RESUME WITH CTRL Q  
CTRL Q RESTARTS TRANSMISSION AFTER CTRL S  
CTRL L FORM FEED/CLR SCREEN  
CTRL O SKIP MESSAGE TEXT WHILE RETRIEVING  
CTRL P INTERRUPTS AND SKIPS TO THE END  
CTRL U DELETES LINE IF USED BEFORE <RETURN>  
CTRL V REVIEW, BUT DO NOT SEND MESSAGE

### ADDITIONAL FORUM COMMANDS

B BULLETINS  
NEW NEW FORUM FEATURES

### LEAVE & READ MESSAGE MODE

A ABORT  
C CONTINUE  
D DELETE  
E EDIT  
I INSERT  
L LIST  
P PREVIEW  
UST USER STATUS  
RE REPLY  
R REPLACE  
SEN# SEND A LINE TO JOB #  
SH STORE TO SUB-TOPIC #  
SP# STORE PRVT TO SUB-TOPIC #  
SU# STORE UNFORMATTED TO SUB-TOPIC #  
SPUH STORE PRVT UNFRMTD TO SUB-TOPIC #  
RT READ THREAD  
UA REPLY (USE ADDRESS)  
RR READ REPLY  
RA READ AGAIN  
RP READ PREVIOUS  
N NEXT MESSAGE  
NS NO STOPS BETWEEN  
SB SUB TOPIC NAMES  
QS QUICK SCAN

### DATA LIBRARY

DES DESCRIBE CURRENT LIBRARY  
DL# CHANGE TO DATA LIBRARY #  
BR BROWSE THRU FILES  
SB TYPE SUB-TOPIC NAMES  
KEY SEARCH KEYWORD LIST  
S SCAN  
R READ A FILE  
DOW DOWNLOAD A FILE  
UPL UPLOAD A FILE  
SUB SUBMIT A FILE  
ERA ERASE A FILE  
PUB GET FROM PUBLIC ACCESS  
NOR NORMAL SIG ACCESS  
T RETURN TO FUNCTION MENU  
UST LIST USERS IN SIG  
SEN SEND MESSAGE TO USER  
SET SET MENU & BRIEF ON/OFF  
OFF LOGS YOU OFF  
? X EXPLAIN COMMAND 'x'

### CB & CONFERENCE COMMANDS

/TUN # TUNES CHANNEL # (1-36)  
/TALK # TALK PRIVATELY W/ JOB#  
/MON #, # LISTEN TO EXTRA CHNLS  
/UNM #, # UNMONITOR CHANNELS  
/STA TYPE CHANNEL STATUS  
/TIM TYPE TIME, DAY, AND DATE  
/UST # USER STATUS TIMEOUT  
/EXI # USER STATUS FOR CHN #  
/WHO EXIT CB SIMULATOR  
/WHO TYPE PPN OF LAST TALKER  
/HAN CHANGE HANDLE  
/SCR XYZ SCRAMBLE ON KEY "XYZ"  
/SMC XYZ SCR & MONITOR CLEAR  
/XLC XYZ TRANSMIT CLEAR  
/UNS UNSCRAMBLE (BOTH CLEAR)  
/SQU ABC SQUELCH HANDLE "ABC"  
/SBU #, # SQUELCH USER ID "#, #"  
/JOB DISPLAY YOUR JOB #  
/PPN SHOW PPNs WITH MESSAGES  
/NOPPN TURN OFF /PPN

### OPTION COMMAND MODE

OP SET OPTIONS.  
BR SET BRIEF MODE. (SUPPRESS MENUS)  
NB NO BRIEF MODE. (RETURNS MENUS)  
LL CHANGE LINE LENGTH.  
FIL USE FILGE EDITOR FOR MESSAGES.  
SED USE FORUM EDITOR FOR MESSAGES.  
DS SET A DEFAULT SUB-TOPIC.  
CN CHANGE YOUR NAME WITHIN THE FORUM.  
PC CHANGE YOUR PROMPT CHARACTER.  
RNS RN (READ NEW) SKIPS MESSAGES YOU LEFT.  
RNI RN (READ NEW) TYPES MESSAGES YOU LEFT.  
TAM TYPE WAITING MESSAGES.  
MAM MARK WAITING MESSAGES. (FOLLOW WITH RM)  
ST STOP SCROLLING BETWEEN MESSAGES.  
NS NO STOP BETWEEN MESSAGES.  
P OPTIONS REMAIN FOR FUTURE SESSIONS.  
SS SCREEN MESSAGES BY TOPIC  
RI READ INDIVIDUAL MESSAGE BY #  
U INTERESTS  
X DATABASE

## ERG-CARD™ FOR USE WITH SpeedScript 3.0

▲ = SHIFT

### EDITING COMMAND SUMMARY

CTRL A CHANGE CASE  
CTRL B CHANGE BORDER COLOR  
CTRL D DELETE (S/W/P)  
CTRL E ERASE (S/W/P)  
CTRL G AUTO SEARCH & REPLACE  
CTRL H HUNT  
▲ CTRL H SELECT HUNT PHRASE  
CTRL I ENTER/EXIT INSERT MODE  
CTRL J REPLACE  
▲ CTRL J SELECT REPLACE PHRASE  
CTRL K KILL BUFFER  
CTRL L CHANGE TEXT COLOR

CTRL R PRINT  
CTRL U RESTORE BUFFER  
CTRL V VERIFY  
CTRL X TRANSPOSE CHARACTERS  
CTRL Z GO TO END OF TEXT  
▲ CTRL Z DISPLAY AVAILABLE MEMORY  
CTRL [ SEND DISK COMMAND/READ ERROR  
CTRL ] DIRECTORY  
CTRL ^ ENTER PRINTER COMMAND  
▲ CTRL ^ TOP OF SCREEN (HOLD FOR TOP OF TEXT)  
▲ CLR/HOME ERASE ALL !!!  
▲ CLR/HOME CURSOR LEFT/RIGHT

▲ RUN/STOP INDENT 5 SPACES  
▲ RUN/STOP INSERT 255 SPACES  
RESTORE EXIT WORDPROCESSING  
BACKSPACE  
DELETE LINE  
DELETE SPACES  
DELETE  
INSERT SPACE  
RETURN RETURN MARK  
RETURN END PARAGRAPH  
RETURN GOTO NEXT SENTENCE  
RETURN GOTO PREVIOUS SENTENCE

### PRINTER & FORMAT CONTROLS

CTRL A TRUE ASCII (OFF)  
CTRL B BOTTOM MARGIN (58)  
CTRL C CENTERING  
CTRL D EDGE RIGHT  
CTRL E FOOTER  
CTRL F GOTO LINKED FILE  
CTRL G HEADER  
CTRL H INFORMATION  
CTRL I SELECT LINEFEEDS  
CTRL J LEFT MARGIN (5)  
CTRL K MARGIN RELEASE

CTRL L NEXT PAGE  
CTRL M PAGE LENGTH (66)  
CTRL N RIGHT MARGIN (75)  
CTRL O SPACING (1)  
CTRL P TOP MARGIN (5)  
CTRL Q UNDERLINE TOGGLE  
CTRL R PAGE WAIT  
CTRL S COLUMNS ACROSS (80)  
CTRL T INITIAL PAGE # (1)  
CTRL U SKIP PAGES  
CTRL V PRINT PAGE NUMBER

SpeedScript 3.0 is available FREE from COMPUTE! Magazine, March '85.

f1	WORD RIGHT
f2	WORD LEFT
f3	NEXT SENTENCE
f4	PREVIOUS SENTENCE
f5	NEXT PARAGRAPH
f6	PREVIOUS PARAGRAPH
f7	LOAD
f8	SAVE

## ERG-CARD™ FOR USE WITH 8510 / Prowriter

8510 / Prowriter  
made by C.Itoh (C-E-toe)  
Electronics, Inc.

### LINE FEED PITCH

27 102 SET FORWARD MODE  
27 114 SET REVERSE MODE  
10 LINE FEED  
27 65 SET 6 LPI MODE  
27 66 SET 8 LPI MODE  
27 84 NN SET NN/144 LPI MODE  
12 FORM FEED  
11 VERTICAL TAB

### CUSTOM CHARACTERS

27 63 n3n2n1 RESERVE CHARACTER SPACE  
27 43 CREATE A CHARACTER  
27 39 ENABLE "NEW" CHARACTERS  
27 117 COPY CHARACTER SET

### TABS AND MARGINS

27 76 n2n1n0 SET LEFT MARGIN  
27 47 n2n1n0 SET RIGHT MARGIN  
27 40 n1n2n3 SET A TAB  
27 41 n1n2n3 CLEAR A TAB  
27 48 INITIALIZE TABS  
9 MOVE TO NEXT TAB

### CHARACTER PITCH

27 78 SET PICA MODE (10 CPI)  
27 69 SET ELITE MODE (12 CPI)  
27 81 SET COMPRESSED MODE (17 CPI)  
27 80 SET PROPORTIONAL MODE  
27 N SET PROPORTIONAL SPACING

### OTHER SIMPLE COMMANDS

13 CARRIAGE RETURN  
17 SELECT THE PRINTER  
19 DESELECT THE PRINTER  
18 ELONGATE JAPANESE  
20 NORMAL JAPANESE  
27 109 48 DRAFT MODE  
27 109 49 NORMAL MODE  
27 91 INCREMENTAL MODE  
27 93 LOGIC MODE  
8 BACKSPACE  
24 CANCEL BUFFER

### COLOR CONTROL

27 67 80... SET THE COLOR "PALETTE"  
27 67 N SET THE RIBBON COLOR

### CHARACTER ENHANCEMENTS

14 DOUBLE-WIDE PRINTING  
15 CANCEL DOUBLE-WIDE  
27 33 BOLD PRINT  
27 34 CANCEL BOLD PRINT  
27 88 UNDERLINE ON  
27 89 UNDERLINE OFF  
27 105 49 ITALICS  
27 105 48 ITALICS OFF  
27 115 49 SUPERSCRIPIT  
27 115 50 SUBSCRIPT  
27 115 48 SUB/SUPER-SCRIPT OFF

### BIT IMAGE GRAPHICS

29... START EVFU  
...30 END OF EVFU  
31 USE EVFU  
27 118 SET VFU  
27 70 n3n2n1n0 SET DOT ADDRESS  
27 86 n3n2n1n0 DOT REPEAT  
27 83 n3n2n1n0 BIT GRAPHICS

### OTHER ADVANCED COMMANDS

27 68 N CLOSE SWITCH  
27 90 N OPEN SWITCH  
27 61 48 UNI-DIRECTIONAL  
27 62 SAME AS ABOVE  
27 61 49 BI-DIRECTIONAL  
27 60 SAME AS ABOVE  
27 61 50 QUASI-DIRECTIONAL  
27 99 49 SOFTWARE RESET  
27 82 n2n1n0 CHARACTER REPEAT

### ALTERNATE CHARACTER SETS

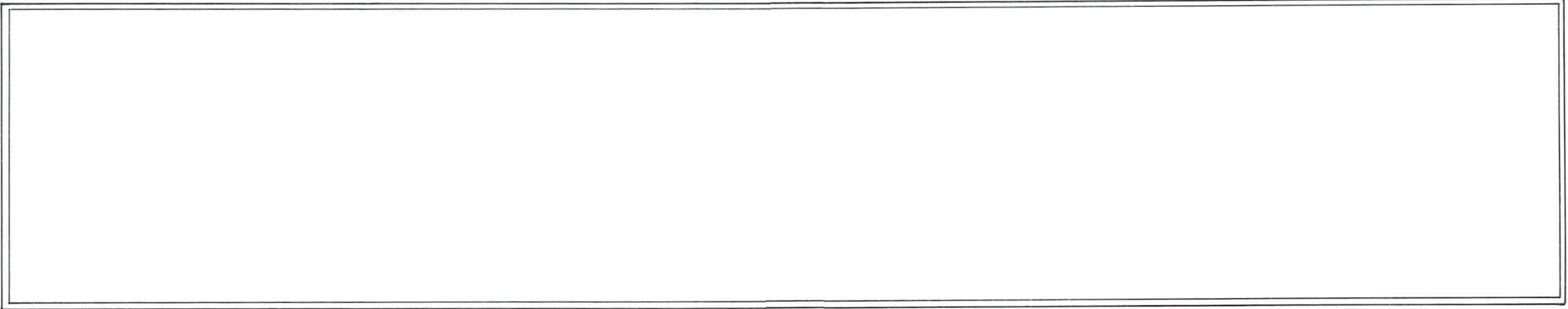
27 36 STANDARD SET  
27 38 GREEK/HIRAGANA SET  
27 35 GRAPHIC/KATAKANA SET

### DEP SWITCH SETTINGS

SW #	FUNCTION	OPEN	CLOSED
1-1	INTERNATIONAL CHARACTER SET		
1-2	"		
1-3	"		
1-4	"		
1-5	PROCESSING OF DC1 & DC3	ON	OFF
1-6	LINE FEED WHEN BUFFER IS FULL	NO	YES
1-7	PRINT COMMAND CODE	CR	CR, LF, VT, FF, US
1-8	LINE FEED WITH CR CODE	NO	YES
2-1	PRINTING OF NUMERAL ZERO	NORM	SLASH
2-2	SELECT BUFFER OPTION	YES	NO
2-3	LENGTH BETWEEN TOP OF FORMS	11"	12"
2-4	LINE SPACING	1/6"	1/8"
2-5	POWER-ON CHARACTER PITCH	10 CPI	PROP.
2-6	SELECTION OF 7 OR 8-BIT DATA	8-BIT	7-BIT
2-7	POWER-ON SELECT STATUS	OFF	SELECT
2-8	UNI OR BI-DIRECTIONAL PRINT	BI-	UNI-

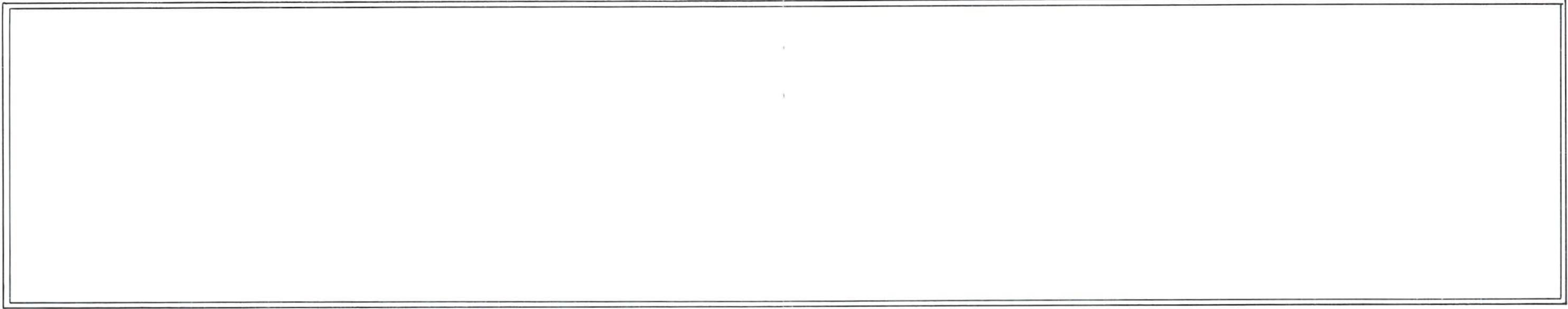
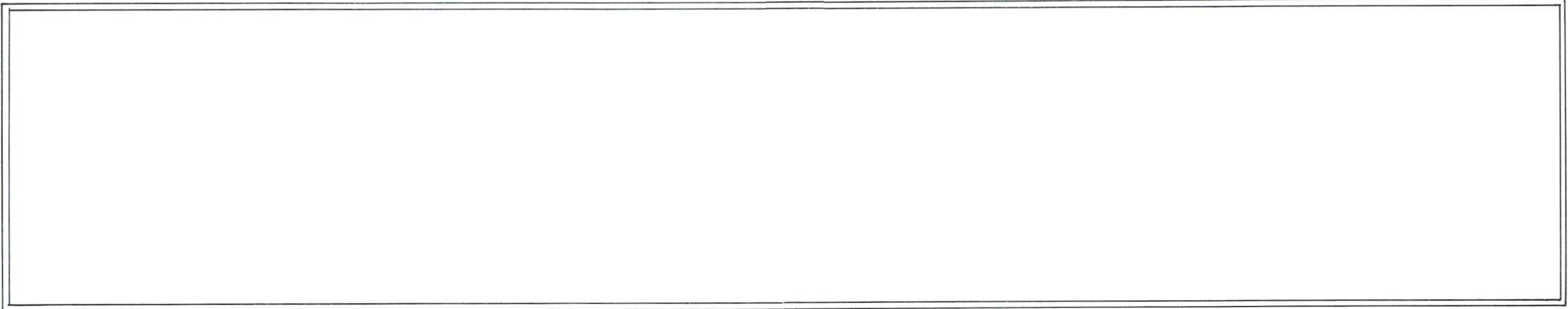
**ERG-CARD<sup>SM</sup> REFERENCE CARDS**

(DO-IT-YOURSELF SIDE)



**ERG-CARD<sup>SM</sup> REFERENCE CARDS**

(DO-IT-YOURSELF SIDE)



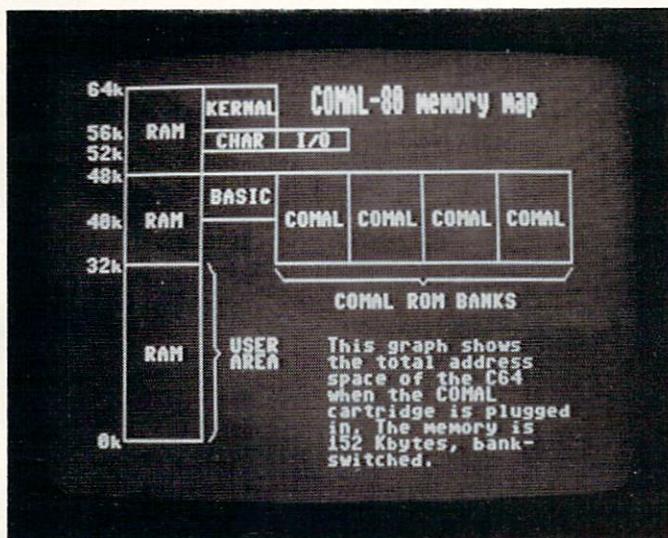
# COMAL 2.01

Reviewed by: Mark Brown

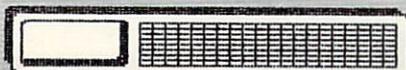
COMAL SPOILS YOU. IT COMBINES THE FAMILIARITY OF BASIC WITH THE STRUCTURED PROGRAMMING ENVIRONMENT OF PASCAL AND THE TURTLE GRAPHICS OF LOGO. WITH ALL THAT AVAILABLE, ANY OTHER LANGUAGE FEELS STIFLING BY COMPARISON. NOW, ON THE HEELS OF THE VERY GOOD DISK-LOADED VERSION 0.14, COMES CARTRIDGE-BASED COMAL 2.01. BESIDES ALL THE FUNCTIONS AND FEATURES OF ITS PREDECESSOR (SEE THE REVIEW & ERG-CARD IN ISSUE #4), THE CARTRIDGE VERSION ADDS LOTS OF EXTRA NICETIES, AND OVERCOMES THE SHORTCOMINGS OF COMAL 0.14.

THE MAJOR DIFFICULTY WITH 0.14 WAS THE MEMORY IT USED UP. BY THE TIME IT LOADED FROM DISK, YOU WERE LEFT WITH ONLY ABOUT 10K OF PROGRAM MEMORY. OF COURSE, THE CARTRIDGE TAKES CARE OF THAT. ON POWER-UP, YOU HAVE OVER 30K OF PROGRAM MEMORY, ALMOST AS MUCH AS WITH BASIC. THE COMAL CARTRIDGE ITSELF CONTAINS 64K (!) OF BANK-SWITCHED ROM, WHICH IS STACKED IN FOUR 16K BLOCKS OVER THE C64'S OWN BASIC ROM AND RAM. YOU DON'T EVER HAVE TO WORRY ABOUT THE TECHNICAL STUFF, HOWEVER; THE BANK-SWITCHING IS AUTOMATIC, FAST, AND INVISIBLE. COMAL 2.01 IS INTERNALLY QUITE DIFFERENT FROM 0.14, AND IS STRUCTURED AS A COMAL KERNEL WITH EXTENSION PACKAGES. THIS IS A MEMORY-SAVING TECHNIQUE WHICH MEANS THAT, FOR EXAMPLE, THE GRAPHICS VOCABULARY IS INACTIVE IF YOU DON'T NEED GRAPHICS IN YOUR CURRENT PROGRAM. WHEN YOU NEED GRAPHICS, THE ONE-LINE COMMAND 'USE GRAPHICS' WILL INVOKE THE NECESSARY ADDITIONS. THIS CHANGE MEANS THAT SOME MINOR TRANSLATION IS NEEDED TO ADAPT COMAL 0.14 PROGRAMS TO RUN ON THE CARTRIDGE VERSION. THE ONLY CHANGES I HAVE USUALLY FOUND NECESSARY ARE TO (1) ADD THE 'USE GRAPHICS' COMMAND TO THE START OF THE PROGRAM, AND (2) MAKE SOME SYNTAX CHANGES TO REFLECT THE REPLACEMENT OF COMMANDS WITH PROCEDURES; I.E. 'BACKGROUND 0' BECOMES 'BACKGROUND (0)'. IF YOU ALREADY HAVE A LIBRARY OF COMAL 0.14 PROGRAMS BUILT UP AND WANT TO ADAPT THEM TO THE CARTRIDGE VERSION, YOU WILL HAVE TO MAKE THESE CHANGES.

THE IMPROVED EDITOR CAN HELP YOU MAKE THEM. BESIDES THE IMPRESSIVE ERROR-CHECKING BUILT INTO THE ORIGINAL, COMAL 2.01 ADDS 'FIND' AND 'CHANGE' TO THE EDITOR'S VOCABULARY. THE PROGRAM STILL AUTOMATICALLY INDENTS WHEN LISTED, WITH THE ADDED OPTION OF HAVING KEYWORDS IN UPPERCASE TO DIFFERENTIATE THEM FROM VARIABLE AND PROCEDURE NAMES. SEVERAL CONTROL KEYS HAVE BEEN DEFINED TO DELETE-TO-END-OF-LINE, JUMP AHEAD OR BACK BY ONE WORD, RESTORE LINE TO PRE-EDITED STATE (GREAT FOR ALL THOSE TYPING MISTAKES!), AND EVEN DUMP THE SCREEN TO THE PRINTER. THE FUNCTION KEYS ARE ALSO DEFINED TO PROVIDE AUTOMATIC RUN, EDIT, AUTO LINE-NUMBERS, ETC. THEY ARE USER-REDEFINABLE, TOO. 'LIST procedure' ENABLES YOU TO LIST AND EDIT PROCEDURES BY NAME. THERE ARE MANY OTHER FEATURES THAT REALLY ARE JUST TOO NUMEROUS TO MENTION.



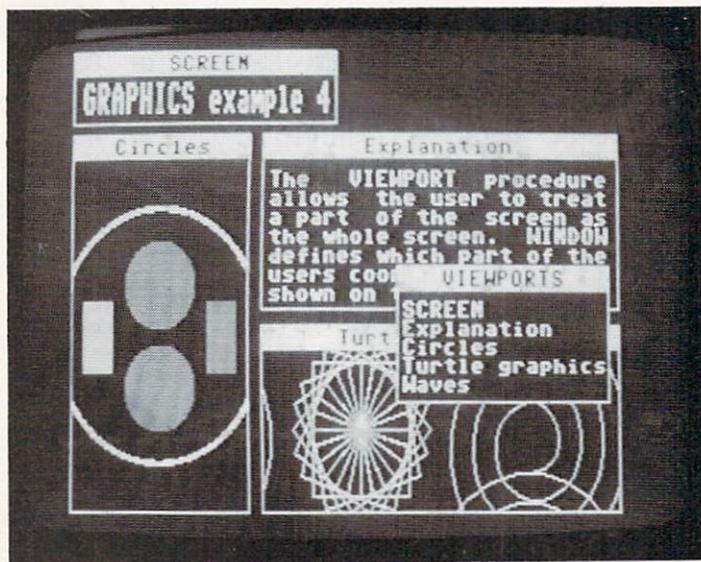
COMAL spoils you...any other language feels stifling by comparison. The cartridge version adds lots of niceties.



THE COMMANDS THAT HAVE BEEN INCLUDED IN COMAL 2.01 WILL KNOCK YOUR SOCKS OFF! I CAN'T POSSIBLY LIST THEM ALL, BUT I'LL TRY TO COVER THE HIGH POINTS IN SOME KIND OF ORDER:

The commands that have been included in COMAL 2.01 will knock your socks off! I can't possibly list them all.

**SYSTEM CHANGES:** 'INPUT' HAS BEEN GIVEN AN EXTREMELY USEFUL NUMBER OF IMPROVEMENTS AND OPTIONS. THE PROMPT CAN BE TOTALLY ELIMINATED, OR MADE TO BE ANYTHING YOU WISH (NO '?' UNLESS YOU WANT ONE), CURSOR MOVEMENT IS NOW IGNORED, AND THE CLEAR AND HOME KEYS ONLY WORK ON THE INPUT LINE ITSELF, NOT THE WHOLE SCREEN. 'INPUT AT' ALLOWS YOU TO SPECIFY A POSITION ON THE SCREEN AS WELL AS THE NUMBER OF ALLOWABLE INPUT CHARACTERS. THERE IS NOW NO QUOTE MODE TO WORRY ABOUT, AND INPUT LINES CAN BE UP TO 120 CHARACTERS. OTHER SYSTEM COMMANDS INCLUDE DIRECT ACCESS TO THE C64'S INTERNAL CLOCK, SINGLE-COMMAND USE OF THE SERIAL OR IEEE BUSES, AND ONE-LINE CONTROL OVER SYSTEM PARAMETERS SUCH AS DISK-DRIVE TIMING AND PRINTER CONTROLS. TWO OF THE MOST USEFUL AND POWERFUL ADDITIONS ARE THE 'GETSCREEN' AND 'SETSCREEN' COMMANDS. THESE ALLOW YOU TO SAVE THE CURRENT CONTENTS OF THE SCREEN, INCLUDING ALL COLORS AND EVEN CURSOR POSITION, AS A SINGLE STRING, AND RESTORE THE SCREEN AT ANY TIME. THUS YOU CAN EASILY PERFORM PAGE-FLIPPING FOR MENU AND HELP SCREENS. ALSO, EXTERNAL PROCEDURES AND BATCH FILES ARE NOW FULLY SUPPORTED. IF YOU ARE A PROFESSIONAL, YOU WILL APPRECIATE THESE CAPABILITIES RIGHT AWAY; HOME PROGRAMMERS WILL FIND THESE TO BE VERY USEFUL TOOLS IN TIME. (MANY OF COMAL'S ADVANCED FEATURES WILL BE NEW TO THOSE WHO ARE USED TO 'NORMAL' HOME COMPUTER LANGUAGES, BUT MOST HAVE BEEN AROUND FOR SOME TIME AS FEATURES IN PROFESSIONAL DEVELOPMENT SYSTEMS.)



**GRAPHICS:** THE TURTLE IS STILL HERE, BUT FASTER THAN EVER. NEW COMMANDS LET YOU QUICKLY SAVE OR LOAD A HI-RES SCREEN; ALSO ADDED IS THE ABILITY TO MAKE INQUIRIES ABOUT THE TURTLE SYSTEM PARAMETERS. THE 'VIEWPORT' AND 'WINDOW' COMMANDS LET YOU DEFINE SCREEN WINDOWS AND SCALE THEM TO WHATEVER SIZE YOU NEED, AND THEY CAN BE USED FOR BOTH TEXT AND GRAPHICS. (YES, COMAL DOES WINDOWS!) ADDITIONAL NEW SPRITE COMMANDS LET YOU MAKE INQUIRIES ABOUT SPRITE STATUS, LINK SHAPE TABLES TO THE END OF YOUR COMAL PROGRAM, AND 'STAMP' SPRITE IMAGES DIRECTLY TO THE HI-RES SCREEN. THERE IS ALSO A WHOLE NEW VOCABULARY FOR PROGRAMMING INTERRUPT-DRIVEN SPRITE ANIMATION THAT WILL RUN COMPLETELY IN THE BACKGROUND OF ANY COMAL PROGRAM. YOU CAN EVEN STOP TO EDIT THE PROGRAM AND THE SPRITES WILL KEEP MOVING! THESE COMMANDS MAKE THE SPRITES INDEPENDENTLY INTELLIGENT, ABLE TO DECIDE WHEN TO MOVE, WHEN TO CHANGE SHAPE, AND WHEN TO DISAPPEAR, ALL BASED ON TIME OR COLLISION CONDITIONS. USER-PROGRAMMABLE CHARACTERS ARE ALSO SUPPORTED WITH THEIR OWN SET OF COMMANDS IN THE 'FONT' PACKAGE. WHOLE CHARACTER SETS AS WELL AS INDIVIDUAL CHARACTERS CAN BE REDEFINED AND SWITCHED BACK AND FORTH.

The 'VIEWPORT' and 'WINDOW' commands let you define screen windows and scale them ...for both text and graphics.

**DEVICES:** FULL SUPPORT IS PROVIDED FOR EASY USE OF PADDLES, JOYSTICKS, AND A LIGHT PEN. THE PADDLE PACKAGE WILL ALSO WORK WITH A KOALA PAD, AND THE JOYSTICK PACKAGE WORKS ADMIRABLY WELL WITH A TRACKBALL OR MOUSE. YOU CAN CONTROL FOUR SEPERATE LIGHT PEN SENSITIVITY SETTINGS, WHICH SHOULD ALLOW THE USE OF EVEN INEXPENSIVE LIGHT PENS TO THEIR BEST CAPABILITY.



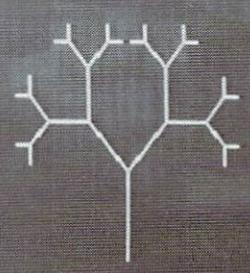
# COMAL 2.01 continued...

```
Turtle example 2:

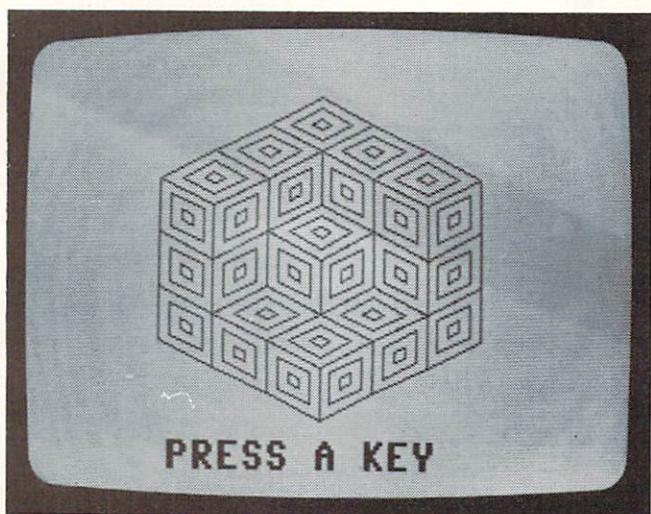
USE turtle
fullscreen

tree(5)

PROC tree(height)
IF height>0 THEN
  forward(height*10)
  left(45)
  tree(height-1)
  right(90)
  tree(height-1)
  left(45)
  back(height*10)
ENDIF
ENDPROC tree
```



The sound package...surpasses the capabilities of even some of the dedicated music programs now on the market.



**SOUND:** THERE IS A TOTALLY NEW VOCABULARY OF SOUND CONTROL COMMANDS. FULL CONTROL OF ALL THE SID CHIP'S REGISTERS IS PROVIDED FOR. TONES CAN BE PRODUCED AT A GIVEN FREQUENCY, OR BY NOTE NAME. INTERRUPT-DRIVEN MUSIC CAN BE PRODUCED WHICH WILL PLAY FULLY IN THE BACKGROUND OF ANY PROGRAM RUNNING. ANY SINGLE VOICE CAN BE STOPPED AND REPROGRAMMED INDEPENDENT OF THE OTHER TWO. THE SOUND PACKAGE MAKES BETTER USE OF THE C64'S SOUND CAPABILITIES THAN ANY OTHER LANGUAGE I HAVE SEEN, AND SURPASSES THE CAPABILITIES OF EVEN SOME OF THE DEDICATED MUSIC PROGRAMS NOW ON THE MARKET.

**OTHER PACKAGES:** I DOUBT MANY OF YOU WILL HAVE A USE FOR 'USE DANSK', WHICH SWITCHES ERROR MESSAGES TO DANISH. HOWEVER, THERE IS THE CAPABILITY TO ADD OTHER PACKAGES AS EXTENSIONS TO COMAL. LATER VERSIONS OF THE CARTRIDGE WILL HAVE AN EMPTY EPROM SOCKET FOR THIS PURPOSE (AS WELL AS FOR DEDICATED APPLICATIONS SOFTWARE). ADDITIONAL PACKAGES MAY ALSO BE LOADED INTO THE RAM UNDER THE ROM SET. THIS CAPABILITY ASSURES THAT COMAL 2.01 WILL NOT BECOME OBSOLETE WITH TIME, AND THAT NEW PERIPHERALS CAN BE FULLY SUPPORTED IN THE FUTURE. (ALREADY AVAILABLE IN EUROPE IS A FULL 'ROBOT-TURTLE' SUPPORT PACKAGE THAT WILL PASS TURTLE-GRAPHICS COMMANDS TO A ROBOT TURTLE PLUGGED INTO THE C64'S USER PORT!)

IT IS VERY HARD TO REMAIN OBJECTIVE ABOUT COMAL. IT HAS SOME MINOR FAULTS, BUT TO MENTION THEM SEEMS LIKE NIT-PICKING. COMAL 2.01 IS JUST SO VERY MUCH BETTER THAN EVERYTHING ELSE THAT IT'S ALMOST RIDICULOUS TO PICK AT IT, BUT I'M SUPPOSED TO BE EVEN-HANDED SO HERE GOES: (1) IT'S NOT AS COMPATABLE AS IT COULD HAVE BEEN WITH VERSION 0.14. THE PACKAGE CONCEPT NECESSITATED SOME SYNTAX CHANGES, BUT AS I MENTIONED ABOVE, THE EDITOR WILL EASILY CHANGE MOST OF THESE FOR YOU. (2) THERE ARE A COUPLE OF MINOR ERRORS IN THE MANUAL. (THERE ALWAYS ARE.) (3) THE CARTRIDGE ITSELF IS DIFFICULT TO SEAT PROPERLY, AT LEAST IN MY OLDER C64. IT COMES FROM FROM HANDIC IN DENMARK, AND I HAVE THE SAME PROBLEM WITH THEIR CALC RESULT CARTRIDGE. I DON'T KNOW WHAT IT IS ABOUT THEM, BECAUSE I HAVE NO TROUBLE WITH ANY OTHER CARTRIDGES, BUT I HAVE TO SUPPORT HANDIC'S WITH A PENCIL UNDERNEATH TO MAKE THEM WORK. THE CARTRIDGE SLOT ON THE NEWER MACHINES MUST BE A LITTLE BIT DIFFERENT.

NOW THAT IBM HAS ANNOUNCED COMAL FOR THE IBM-PC, AND APPLE IS LOOKING INTO IT, WE 'COMAL PIONEERS' ON THE COMMODORE 64 HAVE BEEN PROVEN RIGHT. I THINK COMAL WILL HAVE A LONG AND PROSPEROUS FUTURE IN THE LANGUAGE MARKETPLACE. YOU OWE IT TO YOURSELF TO AT LEAST TRY THE FREE 0.14 VERSION. IF YOU LIKE IT, AND I THINK YOU WILL, MOVE UP TO COMAL 2.01 ON CARTRIDGE. IT IS A POWERFUL, FUN, EASY-TO-USE LANGUAGE THAT YOU WON'T OUTGROW.

COMAL 2.01 CARTRIDGE \$99.95  
CARTRIDGE WITH 2 BOOKS AND 2 DEMO DISKS \$128.90  
COMAL 0.14 ON DISK FREE FROM MANY USERS GROUPS  
COMAL 0.14 STARTER KIT WITH 3 DISKS & BOOK \$29.95  
(PLUS \$2.00 EACH ITEM SHIPPING)  
AVAILABLE FROM:  
COMAL USERS GROUP USA, LTD.  
5501 GROVELAND TERRACE  
MADISON, WI 53716-3251  
(608) 222-4432  
IF YOU HAVE QUESTIONS ABOUT COMAL, DIAL UP THE NEW COMAL BULLETIN BOARD (SYSOP: JEFFREY TURNEY): (608) 233-7711 EVENINGS



# INTRODUCTION TO ASSEMBLY LANGUAGE

by:  
MARK  
BROWN

In this entry-level tutorial, you will not only lose your fear of assembly language, but you will actually customize BASIC with a short but useful routine.

COMPUTERS DON'T SPEAK ENGLISH, THEY SPEAK MACHINE CODE. AND (MOST) HUMANS DON'T SPEAK MACHINE CODE, BUT SOMETIMES WE FIND WE HAVE TO TALK TO COMPUTERS. WHEN THIS NEED ARISES WE USE AN INTERPRETER, JUST AS WE DO WHEN WE HAVE TO TALK TO ANOTHER HUMAN WHO DOESN'T SPEAK OUR LANGUAGE. THE HUMAN-TO-MACHINE INTERPRETER MOST OF US ARE USED TO IS BASIC. IT LETS US PUT DOWN OUR IDEAS IN A FORM OF "PIDGIN ENGLISH" THAT WE CAN UNDERSTAND, AND TRANSLATES IT INTO MACHINE CODE THAT THE COMPUTER CAN EXECUTE. THE PROCESS IS NOT VERY EFFICIENT, BECAUSE ENGLISH IS A MUCH MORE GENERAL LANGUAGE THAN MACHINE CODE. EVEN A SIMPLE COMMAND LIKE "PRINT" MUST BE TRANSLATED INTO A LOT OF NUMBERS (THE MACHINE CODE) FOR THE COMPUTER TO RUN. THE BASIC INTERPRETER MUST ALSO EXAMINE THE "PRINT" STATEMENT IN THE CONTEXT OF THE PROGRAM TO SEE IF WE WANTED A STRING, A STRING VARIABLE, A NUMBER, A VARIABLE, A NUMERIC EXPRESSION, OR A BLANK LINE PRINTED, AND WHETHER WE WANTED IT PRINTED TO THE SCREEN, PRINTER, DISK DRIVE, CASSETTE, OR MODEM. THAT TAKES TIME.

IT WOULD BE MUCH FASTER IF WE COULD SPEAK SOME DIALECT OF THE COMPUTER'S LANGUAGE, SOMETHING AS SPECIFIC AS MACHINE CODE BUT EASIER FOR A HUMAN TO UNDERSTAND. THIS IS THE PRINCIPLE BEHIND ASSEMBLY LANGUAGE. EACH COMMAND IN ASSEMBLY LANGUAGE IS A MNEMONIC (LETTERS THAT ARE AN ABBREVIATION FOR SOMETHING ELSE) THAT CORRESPONDS DIRECTLY WITH A SINGLE MACHINE CODE INSTRUCTION. FOR EXAMPLE, THE ASSEMBLY LANGUAGE COMMAND "LOA" STANDS FOR "LOAD THE ACCUMULATOR". THE ASSEMBLER WILL TRANSLATE THIS INTO JUST ONE MACHINE CODE INSTRUCTION, THE NUMBER THAT MEANS TO THE COMPUTER "LOAD THE ACCUMULATOR." AS YOU CAN SEE, ASSEMBLY LANGUAGE PROGRAMMING DOES REQUIRE THAT YOU UNDERSTAND WHAT HAPPENS INSIDE YOUR COMPUTER. YOU HAVE TO KNOW ABOUT MEMORY ADDRESSING MODES, THE CPU REGISTERS, FLAGS, BINARY LOGIC. HEXADECIMAL NUMBERS, AND HOW INPUT AND OUTPUT ARE HANDLED. DON'T LET THIS DISCOURAGE YOU! COMPUTERS ARE REALLY VERY SIMPLE DEVICES, AND DO EXACTLY AS THEY ARE TOLD. ONE GOOD BOOK AND A LITTLE TIME ARE ALL YOU WILL NEED TO GET STARTED. REMEMBER, ONCE UPON A TIME EVEN BASIC LOOKED LIKE A FOREIGN LANGUAGE TO YOU! (IF YOU DON'T SPEAK BASIC OR SOME OTHER HIGH-LEVEL COMPUTER LANGUAGE YET, I STRONGLY RECOMMEND GAINING SOME FAMILIARITY WITH BASIC, COMAL, PASCAL, OR SOMETHING ELSE BEFORE TAKING ON ASSEMBLY LANGUAGE, JUST TO BECOME FAMILIAR WITH PROGRAMMING STRUCTURE AND LOGIC. YOU DON'T HAVE TO BE AN EXPERT IN ANOTHER PROGRAMMING LANGUAGE BEFORE TACKLING ASSEMBLY, BUT SOME FAMILIARITY DEFINITELY HELPS.)

Remember, once upon a time even BASIC looked like a foreign language to you!

Computers are really very simple devices, and do exactly as they are told.

Even a simple command like "PRINT" must be translated into a lot of numbers...for the computer to run.

One good book and a little  
time are all you will need  
to get started.

BESIDES, YOU CAN GET STARTED IN ASSEMBLY LANGUAGE PROGRAMMING WITHOUT KNOWING ALL THERE IS TO KNOW ABOUT YOUR COMPUTER. ONE OF THE BEST WAYS TO BEGIN IS TO LINK INTO MACHINE CODE SUBROUTINES THAT ALREADY EXIST IN THE COMMODORE 64'S KERNAL AND BASIC ROMS. THIS WAY YOU CAN TAKE ADVANTAGE OF THE MACHINE CODE SOMEBODY ELSE HAS ALREADY WRITTEN WITHOUT HAVING TO UNDERSTAND ANYTHING BUT THE STEPS NEEDED TO CALL THE SUBROUTINE. 'THE COMMODORE 64 REFERENCE GUIDE' LISTS DOZENS OF SUBROUTINES THAT YOU CAN USE, AND TELLS HOW TO ACCESS THEM. HERE'S AN EXAMPLE:

ONE USEFUL AND POPULAR BASIC COMMAND LEFT OUT OF C64 BASIC IS "PRINT AT". THIS LETS YOU PRINT AT ANY DESIRED LOCATION ON THE SCREEN, INSTEAD OF JUST WHERE YOU LEFT OFF LAST TIME. OF COURSE, IT IS POSSIBLE TO POSITION YOUR OUTPUT BY PRINTING A LOT OF CURSOR CONTROLS, BUT WOULDN'T IT BE NICE JUST TO BE ABLE TO TELL THE COMPUTER WHAT COLUMN AND ROW YOU WANTED TO PRINT AT? FORTUNATELY, THERE IS A MACHINE CODE ROUTINE IN KERNAL ROM THAT YOU CAN CALL FROM BASIC TO DO JUST THAT. PAGE 290 OF THE REFERENCE GUIDE TELLS US THIS ROUTINE IS CALLED "PLOT", AND CAN BE USED BY "SETTING THE CARRY BIT TO CLEAR, PUTTING THE COLUMN NUMBER IN THE Y REGISTER, AND THE ROW NUMBER IN THE X REGISTER, THEN CALLING THE ROUTINE". BUT HOW DO WE DO THAT FROM BASIC? WELL, THERE ARE FOUR MEMORY LOCATIONS IN THE COMMODORE 64 THAT MIMIC THE CPU'S FOUR INTERNAL REGISTERS. IF WE JUST POKE THE VALUES WE WANT INTO THOSE LOCATIONS AND THEN SYS TO THE ADDRESS OF THE MACHINE CODE ROUTINE, THE COMPUTER TAKES CARE OF THE REST FOR US. THE LOCATIONS ARE:

```
780.....ACCUMULATOR
781.....X REGISTER
782.....Y REGISTER
783.....STATUS REGISTER
```

THE INSTRUCTIONS FOR USING "PLOT" SAY NOTHING ABOUT THE ACCUMULATOR, SO WE'LL LEAVE THAT ALONE. WE POKE OUR COLUMN NUMBER INTO 782, THE Y REGISTER VALUE, AND OUR ROW NUMBER INTO 781 FOR THE X REGISTER. WHAT ABOUT THE STATUS REGISTER? WELL, WE ARE TOLD WE MUST HAVE THE "CARRY BIT CLEAR". THE STATUS REGISTER IS A SET OF EIGHT FLAGS, EACH SIGNIFYING A DIFFERENT TRUE OR FALSE STATUS. BIT 0 MUST BE EQUAL TO ZERO TO SIGNIFY THE "CARRY CLEAR" (YOU DON'T NEED TO UNDERSTAND THIS IN ORDER TO USE IT) SO WE WILL POKE 783,(PEEK(783)AND254). THIS JUST TURNS OFF THE CARRY BIT WITHOUT DISTURBING THE OTHERS. WE HAVE DONE ALL THE PRELIMINARY WORK, SO NOW WE CAN USE THE ROUTINE FROM BASIC BY USING THE "SYS" COMMAND TO THE ROUTINE'S DECIMAL ADDRESS AT 65520. NOW WHEN WE PRINT TO THE SCREEN, IT WILL BE AT THE ROW AND COLUMN WE SPECIFIED. THIS MAY HAVE SEEMED COMPLICATED WITH ALL THE EXPLANATION, SO HERE ARE THE STEPS AGAIN IN BASIC:

```
POKE 782, COLUMN
POKE 781, ROW
POKE 783, (PEEK(783)AND254)
SYS 65520
PRINT "WHATEVER YOU WANT"
```

THIS ALL WORKS VERY QUICKLY, AND GIVES YOU A CAPABILITY YOU NEVER HAD BEFORE FROM BASIC! STUDY THE DOCUMENTED KERNAL SUBROUTINES IN THE PROGRAMMER'S GUIDE AND YOU WILL FIND SEVERAL VERY USEFUL MACHINE LANGUAGE ROUTINES YOU CAN USE RIGHT AWAY FROM BASIC.

BUT WHAT ABOUT WRITING YOUR OWN ASSEMBLY LANGUAGE PROGRAMS? WHAT WILL YOU NEED? THERE ARE THREE ESSENTIAL TOOLS FOR THE ASSEMBLY LANGUAGE PROGRAMMER:

(1) REFERENCE BOOKS. YOU WILL NEED 'THE COMMODORE 64 PROGRAMMER'S REFERENCE GUIDE' MENTIONED ABOVE, PLUS AT LEAST ONE GOOD BOOK DEVOTED TO PROGRAMMING THE 6502 MICROPROCESSOR. (THE COMMODORE 64 ACTUALLY USES THE 6510 PROCESSOR, BUT IT IS ALMOST EXACTLY THE SAME AS THE 6502; THE 'REFERENCE GUIDE' WILL TELL YOU ABOUT THE MINOR DIFFERENCES.) MOST BIG BOOKSTORES HAVE A GOOD SELECTION. BROWSE THROUGH AND PICK OUT ONE THAT SEEMS TO MAKE SOME SENSE TO YOU. A GOOD COMPREHENSIVE MEMORY MAP IS ALSO ESSENTIAL. THERE IS A PARTIAL ONE IN THE REFERENCE GUIDE, BUT THE BEST AND MOST DETAILED IS 'MAPPING THE COMMODORE 64' FROM COMPUTE! BOOKS.

(2) A MACHINE CODE MONITOR PROGRAM. THIS LETS YOU DIRECTLY EXAMINE AND MODIFY THE COMPUTER'S MEMORY. YOU CAN DISASSEMBLE MACHINE CODE ROUTINES INTO ASSEMBLY LANGUAGE AND ASSEMBLE SHORT ROUTINES OF YOUR OWN DIRECTLY INTO MEMORY AND RUN THEM WITH SIMPLE COMMANDS. YOU CAN ALSO LOAD AND SAVE ROUTINES AND BLOCKS OF MEMORY DIRECTLY. SOME MONITORS ALSO HAVE ADDITIONAL HELPFUL FEATURES. MANY GOOD MONITORS ARE AVAILABLE FROM PUBLIC DOMAIN SOURCES FOR FREE OR FOR A SMALL COPYING FEE. TWO OF THE BEST ARE JIM BUTTERFIELD'S SUPERMON, AND BILL SEILER'S EXTRAMON, WHICH HAS A FEW ADDED FEATURES. THERE ARE ALSO SOME COMMERCIAL MONITOR PROGRAMS AVAILABLE (ALTHOUGH THEY OFFER NO REAL ADVANTAGES OVER THE PUBLIC DOMAIN VERSIONS), AND SOME ASSEMBLER PACKAGES INCLUDE A MACHINE CODE MONITOR.

(3) AN ASSEMBLER/EDITOR. THIS PACKAGE ALLOWS YOU TO EDIT COMPLEX ASSEMBLY LANGUAGE PROGRAMS USING SOPHISTICATED COMMANDS. THE BEST PACKAGES WILL INCLUDE AN EDITOR WITH WORD-PROCESSOR-LIKE COMMANDS (SUCH AS SEARCH-AND-REPLACE OR CUT-AND-PASTE). THE ASSEMBLER ITSELF MIGHT INCLUDE SUCH ESOTERICS AS CONDITIONAL ASSEMBLY AND MACRO DEFINITIONS. GET WHAT YOU CAN AFFORD. EVEN IF YOU DON'T UNDERSTAND WHAT SOME OF THESE THINGS ARE NOW, YOU MAY WANT THESE ADVANCED FEATURES LATER. (SEE THE REVIEW OF THREE POPULAR ASSEMBLERS ELSEWHERE IN THIS ISSUE.)

DON'T BE AFRAID OF ASSEMBLY LANGUAGE. IT TAKES TIME TO LEARN, BUT THE REWARDS TO BE GAINED IN THE FORM OF FASTER PROGRAMS, MEMORY ECONOMY, AND INDEPENDENCE FROM HIGH-LEVEL LANGUAGE RESTRICTIONS ARE WELL WORTH THE EFFORT.

In the next issue, Mark  
will be taking a look at  
some of the more popular  
assemblers on the market  
for the C-64.



# WHITHER

# CP/M?

by: MARK BROWN

CP/M is not a language, but an operating system. It allows the Z80 CPU to take over your Commodore 64.

Commodore took so long getting CP/M to market that the FTC filed suit against Commodore for promising product it couldn't deliver.

IT'S IRONIC, REALLY. ONE OF COMMODORE'S BIG SALES PITCHES WHEN FIRST PROMOTING THE COMMODORE 64 WAS THAT YOU WOULD 'SOON' BE ABLE TO ADD A CARTRIDGE CONTAINING A Z80 CPU CHIP THAT WOULD ALLOW YOU TO RUN CP/M SOFTWARE. THEY CLAIMED THIS WOULD GIVE YOU ACCESS TO 'THOUSANDS OF BUSINESS AND PROFESSIONAL PROGRAMS'. UNFORTUNATELY, COMMODORE TOOK FOREVER GETTING THE PROMISED CP/M CARTRIDGE TO MARKET; SO LONG THAT THE FTC FILED SUIT AGAINST COMMODORE FOR PROMISING PRODUCT IT COULDN'T DELIVER. BUT IN THE MEANTIME, COMMODORE DID START SHIPPING CP/M. THE SUIT ENDED RECENTLY, WITH COMMODORE ADMONISHED NEVER TO PROMOTE 'AIRWARE' (I.E. NON-EXISTANT PRODUCT) AGAIN. ON THE HEELS OF THIS DECISION (THOUGH APPARENTLY NOT BECAUSE OF IT), COMMODORE QUIETLY QUIT DISTRIBUTING ITS CP/M CARTRIDGE. (SPECULATION IS THAT THE NEW 128K, 40/80 COLUMN, C64/CP/M COMPATIBLE COMMODORE COMPUTER DUE OUT IN THE SPRING WILL BE COMMODORE'S ONLY ENTRANT IN THE CP/M MARKET.) DATA 20, A THIRD-PARTY COMPANY, QUIT MAKING IT'S 80-COLUMN CP/M CARTRIDGE FOR THE COMMODORE 64 AT ABOUT THE SAME TIME. AND IT'S TOO BAD.

THERE HAVE BEEN THREE ARGUMENTS AGAINST CP/M ON THE COMMODORE 64 FROM THE START. THE FIRST WAS THAT CP/M SOFTWARE IS GENERALLY AVAILABLE ONLY ON IBM FORMATTED 8" DISKS. THIS MEANT THAT THE EXTENSIVE CP/M LIBRARY WOULD HAVE TO BE TRANSFERRED SOMEHOW TO 1541 DISK FORMAT TO BE AVAILABLE FOR USE. NOT REALLY MUCH OF AN OBJECTION, THOUGH MUCH WAS MADE OF IT EARLY ON. THE SAME COULD BE SAID FOR APPLE CP/M AND OTHER MICRO VERSIONS, ESPECIALLY FOR COLECO ADAM CP/M, WHICH USES TAPE INSTEAD OF DISKETTES! THE SECOND OBJECTION WAS THE C64'S 40-COLUMN SCREEN WIDTH. MOST CP/M SOFTWARE WAS WRITTEN TO RUN ON 80-COLUMN BUSINESS MACHINES, AND WOULD HAVE TO BE REWORKED TO FIT ONTO 40 COLUMNS. AGAIN, THE SAME IS TRUE OF APPLE CP/M AND THE REST. THE THIRD AND ONLY REAL OBJECTION TO C64 CP/M WAS ITS SLOW DISK DRIVE ACCESS TIMES. CP/M IS VERY DISK INTENSIVE, AND C64 CP/M DOES SUFFER FROM THE DISK WAITS. BUT IT'S NOT FATAL, ONLY A NUISANCE. WITH ALL THIS CRITICISM LEVELLED AT IT FROM THE START, AND THE LONG LAG TIME BETWEEN ITS ANNOUNCEMENT AND DELIVERY, IT IS REALLY NO WONDER THAT C64 CP/M NEVER REALLY CAUGHT ON. I WAS APPREHENSIVE MYSELF, BUT I WAS WRONG.

MY CP/M CARTRIDGE COST ME ABOUT \$70 AT THE LOCAL K-MART. APPLE CP/M COSTS ABOUT \$250. BOTH HAVE THE SAME CAPABILITIES, SO ONCE AGAIN THE COMMODORE 64 PROVES THAT APPLES (AND IBMS, AND OTHERS) ARE NO BARGAIN. THE CARTRIDGE IS STURDY AND OVERSIZED, AND THE CP/M OPERATING SYSTEM DISK IS IMMEDIATELY COPYABLE. THE MANUAL IS WELL-DONE AND CLEAR, THOUGH IF YOU'RE A CP/M NOVICE YOU'LL NEED A GOOD TUTORIAL BOOK TO HELP YOU GET STARTED.

A WORD NEEDS TO BE SAID HERE ABOUT WHAT CP/M REALLY IS: IT'S NOT A LANGUAGE, BUT AN OPERATING SYSTEM. THAT IS TO SAY, IT ALLOWS THE Z80 CPU IN THE ADD-ON CARTRIDGE TO TAKE OVER YOUR COMMODORE 64. ANY PROGRAMS YOU WANT TO RUN AFTER THAT HAVE TO BE WRITTEN IN Z80 MACHINE CODE, OR RUN IN A HIGH-LEVEL LANGUAGE LOADED INTO MEMORY THAT WAS ITSELF WRITTEN IN Z80 MACHINE CODE. ALL CP/M PROVIDES IS AN ENVIRONMENT THAT SUPPORTS BASIC INPUT AND OUTPUT (BIOS) AND A BASIC DISK OPERATING SYSTEM (BDOS). THE Z80 MACHINE CODE LINKS INTO THESE STANDARD SUPPORT SYSTEMS, AND THIS IS WHY CP/M PROGRAMS ARE SO TRANSPORTABLE FROM SYSTEM TO SYSTEM.

If you have an interest in 'C' FORTRAN, COBOL, LISP, etc., CP/M is currently the only way to use them on your C-64.

Hundreds of public domain CP/M programs are available for download from bulletin board systems all across the country.

Mark Brown will be covering the CP/M situation as it develops, especially as it affects the C-128.

Next issue, he will let you know more about what will run on the C-128, what's worth running, whether it's still being made, how much it costs, and where to get it.

We will also begin reviewing the best of the CP/M software (and there is a ton of it to review!) on a regular basis.

- the editor

THERE ARE VERY FEW CP/M PROGRAMS AVAILABLE THAT HAVE BEEN DEVELOPED SPECIFICALLY FOR THE COMMODORE 64, BUT THERE ARE SOME TRANSLATIONS. ONE OF THE MOST FAMOUS APPLICATIONS CURRENTLY AVAILABLE IS BORLAND INTERNATIONAL'S TURBO PASCAL. (UNFORTUNATELY, THE COPY I RECEIVED HAD A BUG IN THE EDITOR, SO I WON'T BE ABLE TO REVIEW IT HERE YET. SUFFICE IT TO SAY THAT IT IS HIGHLY REGARDED ON THE APPLE II AND IBM PC.) CARDINAL SOFTWARE IS PROBABLY THE MOST ACTIVE THIRD-PARTY SUPPORTER OF THE 250,000 COMMODORE CP/M USERS. THEY OFFER AN EXCELLENT CP/M TERMINAL UPLOAD/DOWNLOAD PROGRAM, A NICE DISKFUL OF CP/M UTILITIES, AND A SMALL LIBRARY OF PUBLIC DOMAIN PROGRAMS. THIS PUBLIC DOMAIN LIBRARY, WHICH IS MADE AVAILABLE WITHOUT DOCUMENTATION AT \$10 PER DISK, INCLUDES A COBOL COMPIILER, A WORD PROCESSOR, A Z80 ASSEMBLER (A STEP UP FROM THE STANDARD 8080 ASSEMBLER INCLUDED WITH CP/M ITSELF), FIG-FORTH, AND SMALL'C'2. HUNDREDS OF PUBLIC DOMAIN CP/M PROGRAMS ARE ALSO AVAILABLE FOR DOWNLOAD FROM BULLETIN BOARD SYSTEMS ALL ACROSS THE COUNTRY. BUSINESS PROGRAMS, APPLICATIONS, LANGUAGES, AND GAMES ARE ALL OUT THERE, AND MANY WILL RUN WITHOUT MODIFICATION ON THE COMMODORE 64.

SO WHY WORRY ABOUT ALL THIS NOW? BECAUSE IT'S YOUR LAST CHANCE! EVEN THOUGH DISCONTINUED, MANY MAIL-ORDER HOUSES, DISTRIBUTERS, AND LOCAL STORES STILL HAVE THE CP/M CARTRIDGE IN STOCK. (MY LOCAL K-MART STILL HAS TWO LEFT. LOOK AROUND.) IF YOU HAVE AN INTEREST IN THE 'C' PROGRAMMING LANGUAGE, FORTRAN, COBOL, LISP, ETC., THEN CP/M IS CURRENTLY THE ONLY WAY FOR YOU TO USE THEM ON THE COMMODORE 64. AND, AS AN ADDED BONUS, MOST OF THESE LANGUAGES ARE AVAILABLE FREE OR FOR A VERY MINIMAL CHARGE. THERE ARE ALSO THE BUSINESS PROGRAMS AVAILABLE, AND THE CHANCE TO EXPERIMENT WITH A Z80 CPU WITHOUT BUYING A WHOLE NEW COMPUTER. ANY ONE OF THESE MIGHT BE A GOOD REASON FOR YOU TO WANT CP/M NOW, WHILE IT'S STILL AVAILABLE.

**C64 CP/M CARTRIDGE** APPROXIMATELY \$70  
AVAILABLE ONLY WHERE YOU CAN STILL FIND IT!

**TURBO PASCAL** \$49.95 FROM:  
BORLAND INTERNATIONAL  
4113 SCOTTS VALLEY DR.  
SCOTTS VALLEY, CA 95066

**CP/M TERM** \$49.95  
**CP/M UTILITIES** \$24.95  
**PUBLIC DOMAIN CP/M DISK** \$10/ EACH  
AVAILABLE FROM:  
CARDINAL SOFTWARE  
DIST. BY VIRGINIA MICRO SYSTEMS  
13646 JEFFERSON DAVIS HIGHWAY  
WOODBRIIDGE, VA 22191

**CP/M BULLETIN BOARDS:**  
(213) 799-1632 SOUTH  
(214) 913-8274 WEST  
(312) 326-4392 NORTH  
(201) 584-9227 EAST

NO GUARANTEES ARE MADE THAT THESE ARE STILL UP AND RUNNING OR THAT THEY WILL HAVE C64 COMPATIBLE SOFTWARE AVAILABLE. THESE THINGS ARE HARD TO KEEP UP WITH! ALSO REMEMBER COMPUSERVE. IT'S PROBABLY THE BEST PLACE TO GO TO FOR GENERAL INFORMATION.



# THE PRINT SHOP

REVIEWED BY: TED SALAMONE

Commodore 64 owners rejoice! Broderbund has finally released your version of their fantastic Print Shop. No longer will you have to drool over the cards, banners, and signs your Apple owning acquaintances make with it.

Unlike most programs converted from the Apple II to the Commodore 64, The Print Shop didn't suffer (significantly) in the process. Except for a minor point here or there, the Commodore version is an exact duplicate of the earlier Apple release.

Besides the disk itself, Broderbund has put a lot of goodies in The Print Shop package. Colored, micro-perf edged tractor feed stationery and matching envelopes come as standard equipment, there's an order form for refill stationery and ribbons (black or colored), a handy dandy reference card, a sample greeting card, and the Reference Manual.

The paper/envelope combination gets you off to a good start right out of the gate. This attention to detail and strong desire to meet your needs continues from this here on. Aside from the hardware (naturally), TPS supplies everything you'll need to become a Junior Gutenberg in one afternoon.

The Pixellite Computer Products Order Form provides users with a reliable, mail/phone order source for colored paper, ribbons and envelopes as well as a free one year subscription to The Print Shop Users' Newsletter. (This, by the way, is a good place to have your creations and/or PS hints and tips published for all interested parties to see).

The sample greeting card is included to illustrate the proper method of folding a standard letter size page after it's been printed. This real life example says it better than words ever could.

Reference cards usually depict the command key setup and a few particulars about program operation. In that regard this one is no exception, for it highlights CTRL key features, text entry commands, and the program loading instructions.

There is however, something more to this card. It pictures each of the eight available fonts as well as the predefined graphics and patterns resident on the program disk. (This is invaluable as the graphics, unlike those of its Apple counterpart, do not appear on-screen during the selection/layout process).

Get ready for a real shock, The Print Shop has a manual the likes of which have rarely been seen in Commodoreland. Hats off to the team that prepared this one! They are to be applauded for their organizational skills, attention to detail (there it is again), presentation, execution, and lavish use of graphic examples and illustrations.

Also, the manual speaks to, but never down at you. Likewise it's clear, concise and most fluid. The importance of such a clean flow of information cannot be overemphasized. This manual has got to be one of the top five written for any art/graphics package on the market today!

The excellence of the manual is almost a shame however, for the menu driven Print Shop is a snap to learn using the reference card alone. Going out on a limb somewhat, it's even possible (thanks to a well conceived help screen) to access 90 per cent of the program's functions and powers without any sort of written instructions whatsoever. It's that well done; that user friendly, that idiot proof!

The list of achievements goes on. Printers supported include the Commodore 1525, MPS-801, (the graphic 802 works as well since it emulates the 1525), the Epson RX, MX, and FX machines, the Star 10 and 15X, and the C-Itoh 8510. Other units included are the Blue Chip, Okidata 92/93, the Mannesmann Tally Spirit 80, the NEC 8023A and the Panasonic P-1090/1091 printers. That's quite a laundry list if you ask me.

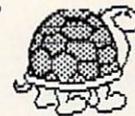
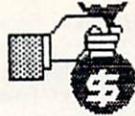
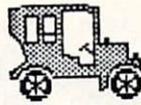
Naturally some of the aforementioned printers require suitable interfaces when linked to the 64. As far as that less than straightforward matter is concerned, TPS works with the following interfaces: Xetec, Cardco, Grappler CD, Tymac Connection, TurboPrint/GT and the Micro World-350. Just like a Who's Who in the interface world!

All the routines are accessed from the Main Menu via seven options. On initial boot SETUP is preselected for printer type designation. Be forewarned, there are no provisions for custom printer/interface connections. Only the specified combinations can be used successfully.

Whether working on a greeting card, sign, letterhead, or banner, the 60 predefined symbols and background patterns can be reproduced at will. The symbols (graphics) can be printed in small, medium, or large sizes in a staggered, tiled (side by side), or customized layout.

Border options range from types of lines (thin, thick, and double) to beads, hearts, flowers, stars, and a lattice or wicker effect. The number of permutations is simply mind boggling!

# PRINT SHOP



CONTINUED...

You can choose from script, hi-tech, casual, block, typewriter-like, stencil-like or news oriented typeface. The styles provide plenty of diversity.

Messages can be large or small, edited, centered (left to right or top to bottom), or right or left justified. The text can be output in solid, outline, or three dimensional perspectives. Such output can be varied from line to line, making for a real professional look.

The Screen Magic Main Menu option provides two kaleidoscopes which can be frozen in motion and merged with text (any font) before being output to a printer. The only disappointing thing about this segment of TPS is that the kaleidoscopes unfold their magic in black, white, and various shades of grey. At first I thought my 1702 was on the fritz!

Still, the output is impressive when the right text layout's been superimposed on a pattern suspended at precisely the right moment.

There's still more. Thanks to the Graphics Editor feature of The Print Shop you can use a joystick, Koalapad, or the keyboard to edit pre-existing shapes or create totally new ones. These "newborns" can then be saved to data disks for later retrieval, alteration, and hard copy output. Let your creative juices flow!

In the midst of all this euphoria there are four items to consider. To begin with this is the first application I've encountered where Suncom's Animation Station doesn't work when the Koalapad does. Secondly, there's a small matter of color. Besides using colored ribbons (and multiple runs past the printhead), colored paper, or coloring the output by hand, there's no way to produce multicolor hard copies. Output speed is another matter you should be aware of. Last, but not least, it's impossible to retrieve files made by other programs like Graphics Magician, Doodle, or Paint Magic.

These concerns will affect everyone differently. Koalapad owners won't give a hoot (except when they try to include pictures created with the pad); Suncom owners will have to live with joystick or keyboard control.

While it would be great to have single pass multicolor capabilities, The Print Shop offers too much else to dismiss it for lacking such capability.

Graphic outputs have been known to tie up printers for some time; TPS being no exception. Average cards take about five minutes to produce, 7 foot banners run about thirty minutes (on a C-Itch).

As far as the incompatibility issue goes, we'll have to live with it for the time being. Thankfully most 64 owners don't have the need to interface the output from various art and design programs. I'd bet most don't own The Print Shop and/or one of the others anyway!

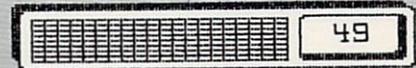
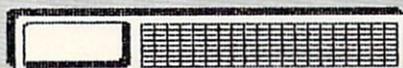
On a Print Shop wish list these items would certainly be top priorities. Some may even be impossible to "fix". If you haven't guessed by now, the only rational reason for pursuing this tack any further would be to make a great program even better.

Make no mistake about it, despite limitations (some hardware based) Broderbund's The Print Shop is a must have program for every Commodore 64 owner with a suitable printer.

Aside from the fun of producing banners, signs, etc., one must also consider the profit motive. Just think of all the SALE signs splashed across storefront windows, the small clubs that need agendas and newsletters printed, or the companies that distribute promotional coupons and advertising flyers on a local level. Young entrepreneurs, you know what to do!

**INFO-64 MAGAZINE**

INFO-64 MAGAZINE



# HOME- MADE MONEY

by Don Vandaveater

Somewhere in your home is a fantastic money making machine. It may be in your living room in a place of honor, or, it may be in your den or office. Maybe, heaven forbid, it's on a shelf in the closet, alone and forgotten. What is this money machine? It's the Commodore 64, and it can change your life by helping you to make "home made money". The May 3rd 1982 issue of Business Week magazine quotes economist Elisabeth Allison of Data Resources Inc. as saying, "There are now 15 million information-manipulation jobs--such as computer programing, financial analysis, and writing--that could be done at home." The problem is that not enough people own a computer to fill all of these jobs. But you and I do. So lets put them to work. Ready?

First, what type of person can operate a Home Made Money Machine? Anyone who can figure out how to turn it on and off can usually learn the basics of making money with his or her computer. Do I need to know how to program? No!!!! But it would help in the number of business choices that you have. What kinds of businesses can be operated at home using a computer? We don't have enough room here to list more than just a few, but hang on to your hat because the list will surprise you.

## LIST OF BUSINESS IDEAS



Apartment Finders	Menu Planning
Babysitting Referral	Message Centers
Bartering Service	Money Management
Billing and Invoicing	Novelties and Gift Service
Bookkeeping Services	Nutrition Counseling
Business Newsletters	Party Planning
Church Newsletters	Remailing Service
Club Newsletters	Resume Service
Computer Instuction	Retirement Counseling
Computer Newsletters	Secretarial Services
Computer Repair	Shoppers' Guides
Custom Programing	Software Finder Service
Direct Mail Service	Software Reviews
Electronic Garage Sales	Sports Statistics
Fund-raising	Tax Records
Gift-Buying Referral Service	Travel Planning
Hunting / Fishing Info Exchange	Tutoring
Inventory Records	Word Processing
Job Placement Service	Writing Books
Lost Pet Service	Writing Business Letters
Mailing Lists	

## HOW DO I GET STARTED?

First, decide if you really want to go into business and if you're the type to own your own business. Here's a list of things you need to consider:

## BE SURE OF WHAT WHAT YOU WANT

- 
- (1) Talk your business idea over with everyone that it will affect. This includes not only your family, but also your neighbors. You don't want to hear objections after it's too late.
  - (2) Decide why you want to go into business. Is it for extra income, for full-time income, or something to do with your time?
  - (3) Can you devote enough time to your business to make it succeed?
  - (4) Do you want a business with a lot of contact or very little contact with the public?
  - (5) How much can you afford to invest in the business? How much can you afford to lose? Not every business is a success. I do not recommend you invest if you can't afford to take the chance.
  - (6) Do you already have the equipment you need to go into business?
  - (7). Do you need special training before you start? If so is it available locally?
  - (8) Whose business is it? Are you starting a sole proprietorship, a partnership, or a corporation? Ok, who's to work the business? Just you, you and a friend or another member of your family? Can you work together and get along? What happens to the business if you can't get along?

# HOME-MADE MONEY

CONTINUED



(Significant advances in printer technology will be needed before counterfeiting will be a practical home money-making alternative... - the editor)



(9) How much money does your business need to make? If you need to make \$1,500 a month profit, do not pick a business that can only provide \$1,500 a month profit or when costs go up the business will not support you.

(10) Do you have local consultants or organization such as the Chamber of Commerce or SCORE to guide you in areas your unsure of? Are you willing to go to them for help?

After you have decided that you do want to go into business for yourself, then you need to write out a business plan. This can mean the difference between success and failure. Use the following guide to help in writing your business plan.

## PLANNING FOR SUCCESS

(1) Business Definition: Describe the type of business that you want. Will it provide a service or a product? Include why you feel it will succeed.

(2) Evaluate the Market: Are you trying to reach computer owners, small businesses, home owners, renters, farmers? Is the market big enough? It's hard to reach farmers from the middle of Chicago.

(3) Competition: Is there a cheaper way for customers to get the same service or product?

(4) Advertising: Will you advertise on radio, TV, newspapers, or will you have to rely on word-of-mouth advertising?

(5) Pricing: If your business is a service, are you going to charge by the job or by the hour. If you're selling products, how much will it cost to produce the product? Can you have a constant supply of materials? Pricing is one of the most difficult areas for any business. You will have to figure the break-even point and a fair profit, but not over-charge the customers. You may need to consult an expert when it comes to pricing.

(6) Billing: This is also a difficult area. In some cases billing a customer can mean more business. It can also create problems when you try to collect. I have a very simple rule of thumb. Do not bill for what you can not afford to lose.

(7) Zoning: Will your business need to comply with local codes? Will you need a license or special insurance?

(8) Bookkeeping: Do you intend to take care of your own bookkeeping or will you need to go to an expert to set up your books?

(9) Location: Will your customers come to you or will you need to go to your customers?

(10) Growth: Can your present community sustain any desires you may have for future growth?

Now set the date you plan on opening your business. Is that all there is to starting a business at home? No!! It takes hard work, but if you "plan your work and then work your plan" you have a very good chance of being successful. The rewards are worth it. For example you can enjoy the extra income your own business can bring in. The entire family can become involved which gives them time together. And my favorite benefits are no time clock to punch and NO boss to listen to.

Can a home business really succeed? Yes! Hugh Hefner started Playboy magazine on his kitchen table, Mother Earth News magazine started as a home business. Even the Apple computer was started in Steve Jobs' garage by him and his partner Stephen Wozniak. Yes, home businesses can succeed. But it takes work.... So get started!

**Don Vandeventer** is a home business consultant & regular contributor to INFO-64. He is the author of **MAKING THE BEST CHOICE, A GUIDE TO CHOOSING THE RIGHT HOME BUSINESS OPPORTUNITY** and **THE SMALL BUSINESS GUIDE TO THE COMMODORE 64**. Both books are available from **Work At Home Press**, Dept. I, P.O. Box 5520, Ocala, FL 32678.



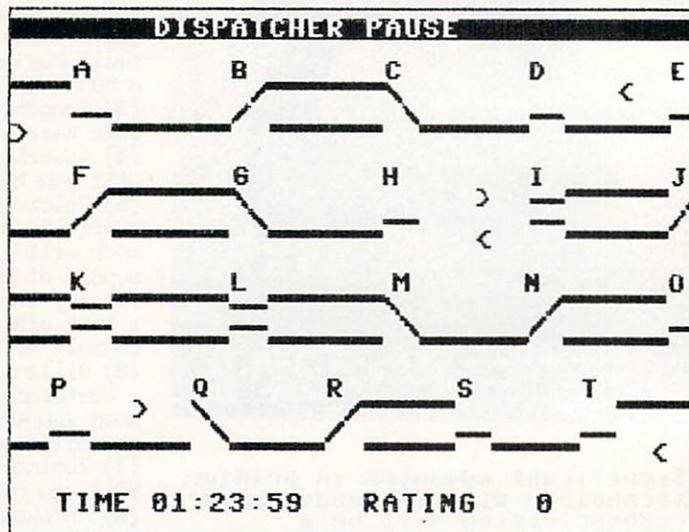
# MINI-REVIEWS BY: MARK BROWN

## TRAIN DISPATCHER

SIGNAL SOFTWARE CONSULTANTS

PO BOX 18222  
PITTSBURGH, PA 15236  
[412] 655-7727

No flashy graphics, just an accurate simulation of a day in the life of a train dispatcher. You contend with train crew schedules, track maintenance, and transmit train orders to try and keep the trains rolling over 150 miles of track without a hitch for your full 8 hour shift. Five levels of play, from the simple "Visitor" to the more realistic "Trainmaster". Includes a handy keyboard overlay, and the manual is nicely organized, with a glossary and tables and diagrams to help you interpret what you see on the screen. The screen displays are simple, displaying track zones and crew schedules. The two-step process involved in first setting and then transmitting an order may confuse you at first, but that's the way it's done in real life, folks. My dad, just retired as a trainmaster after 40 years with the railroad, says Train Dispatcher is just about as aggravating as the real thing. If it had derailments, strikes, and crewmembers not showing up for work, it would be 100% accurate. A good excursion into an application that computers were really meant for, simulation.

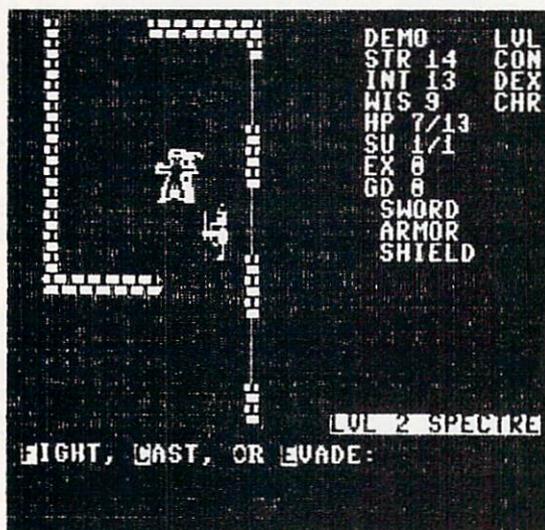


## TELENGARD

AVALON HILL GAME COMPANY

4517 HARFORD ROAD  
BALTIMORE, MD 21214  
[301] 254-9200

A classic graphic underground adventure featuring a reputed 50,000 rooms to explore! A full complement of monsters, characters, weapons, and spells inhabits the world of Telengard. You begin on the first level underground as a novice hero with one spell available to you. By defeating monsters and gathering treasure (and judiciously retreating to the inns on the surface to heal and bank your loot occasionally) you increase in prowess and stature, able to challenge more terrible adversaries on deeper levels. The game lets you save a good character to disk to take up the adventure again another night; it's a good idea to do this occasionally, anyway, in case you get killed off: you can start over where you were before instead of starting completely over. Unambitious static sprite graphics and subtle sound effects add some spice to the scrolling map display (draw it out on paper or you'll get hopelessly lost!). Unexpected 'boxes with buttons' and other weird items also spice up the game play. Not as imposing, varied, or impressive as more recent adventures (such as the Ultima series), but an inexpensive and colorful introduction to adventure gaming. A good manual with a command key reference; an untimed learning demo mode; and only veiled hints about the spells and challenges awaiting you on deeper levels.....

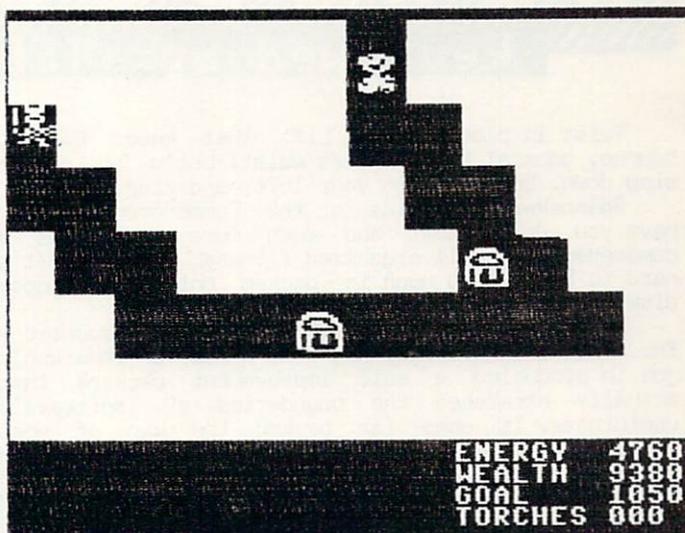


## MINI-REVIEWS cont'd.

### ADVENTURE CREATOR

SPINNAKER SOFTWARE CORPORATION  
215 FIRST STREET  
CAMBRIDGE, MA 02142

Adventure Creator is a marvelous graphics adventure creation program. It creates a dungeon for children to explore, and populates it with strange creatures and wonderful treasures, or lets them create their own adventures to try out on each other. The quests are challenging and non-violent (no raging battles, and many of the creatures are downright friendly). Fun for younger kids who just want to roam around using the joystick to see what happens, and for older kids who want to create complex mazes and use the full complement of tricks, traps, creatures, and spells available. Another solid winner from Spinnaker.



### POWER 64

PRO-LINE SOFTWARE  
755 THE QUEENSWAY EAST, UNIT 8  
MISSISSAUGA, ON CANADA L4V 4C5  
[416] 273-6358

A BASIC programmer's dream utility package. In 4k to 8k of memory, depending on how much Power you want, Power 64 adds auto line number and renumber, search and replace, bidirectionally scrolling listings, undo (unnew), keyboard redefinition, disk commands, listing of disk files, memory partitioning, trace, dump, delete, exec disk file, fix memory pointers, and advanced error reporting, among others. (Whew!) The only complaint I've ever heard on it is that the renumber utility doesn't properly tag invalid GOTOS and GOSUBs. (It renumbers valid ones fine, though.) The manual is thorough, if a bit hard to get around in. It includes important info on how Power works, how to call Power routines from machine code, and how to extend the power command set. A classic and essential programming tool for the serious BASIC (or Pal assembler) programmer.

### MR. TESTER

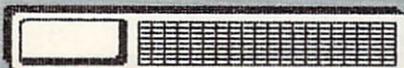
MICRO-K  
1342B ROUTE 23  
BUTLER, NJ 07405  
[201] 838-9627

This is a program to test out certain basic aspects of your computer and common peripherals: cassette drive, printer, disk drive, joystick, or monitor. It will tell you if a joystick's contacts all work, or if a keyboard key is sticking, or if your printer interface really is emulating a Commodore printer 100%, or if your disk speed is close to what it should be, among other things. It will not tell you if some weird serial bus problem is hanging up your system, or if your modem works, or if your power supply is producing some strange intermittent spikes, or if your sprites are colliding with 'sparkle'. The manual is so thin it's almost nonexistent, but the program is menu-driven and pretty well self-explanatory. If a problem is discovered, it will give you no clues on how to go about correcting it. Mr. Tester is no replacement for a good technician, and is not the complete and comprehensive computer diagnostic test program it claims to be, but it may provide some peace of mind in certain situations.

#### MR TESTER MAIN MENU OPTIONS:

- (A) COLOR MONITOR TEST.
- (B) COMMODORE 64 MEMORY TEST.
- (C) KEYBOARD/SCREEN TEST.
- (D) 1541 DISK DRIVE TEST.
- (E) JOYSTICK TEST.
- (F) 1525 PRINTER TEST.
- (G) MUSIC TEST.
- (H) CASSETTE TEST.
- (I) 1541 SPEED/ALIGNMENT TEST.
- (X) RETURN TO BASIC.

ENTER YOUR OPTION: ■



# AEROBICS

Reviewed by: TED SALAMONE

Twist in place. Jog! Lift that knee. Bounce, bounce, bounce! Stretch that waist! Let's go, don't slow down. Once more to your left, and stop.

Spinnaker's Aerobics for the Commodore 64 will have you doing that and much more as it is a comprehensive, well organized fitness program. It's hard to believe so much is packed onto one floppy disk.

Interactive Picture Systems, the firm responsible for designing Aerobics, has done quite a remarkable job in producing a self improvement package that actually stretches the boundaries of software's usefulness. It goes far beyond the ken of most educational or recreational titles available in today's crowded, me-too marketplace.

One of the key's to its tremendous acceptance and subsequent success is innovation. After that, the professional, top flight execution becomes a sustaining factor.

Aerobics provides a three level, complete workout ( 35 minute Beginner, 60 minute Intermediate, and 80 minute Advanced) as well as fifteen, "a la carte" routines which concentrate on certain areas of the body. Because of this tremendous flexibility the program can be used by anyone, regardless of their current physical condition.

A well illustrated (numerous line drawings interspersed with black and white photos depicting actual screen shots) manual provides reinforcement at the outset by stating the goals, objectives, and benefits of such a regimen.

Next a pre-start checklist makes sure that everyone is properly prepared. Setting aside a block of (hopefully) non-interrupted time at least three times a week is recommended; while the importance of doing the exercises correctly (to ensure maximum advantage) is stressed.

Proper breathing is discussed (this aspect is more important than can be imagined!), the correct articles of clothing are described, and the need to exercise in a spacious area is covered.

Even the right posture for startup, the importance of going at your own pace, and the benefits of integrating exercise into other daily routines are mentioned. Like I said before, comprehensive.

Besides the warm up, full scale aerobics, and cool down sequences, sections of the body are covered in specialized segments running anywhere from twenty five to sixty minutes, with the average being in the thirty to forty five minute range. The arms, waist, legs, hips, stomach, and buttocks receive this detailed attention. It's all here!

Working up from the easy level, new exercises are introduced in the Intermediate setting. Even further along, the Advanced level has more specialized routines with increased numbers of repetitions. No one said it was going to be easy at the top.

Each exercise is performed by a video companion while written instructions appear along the lower edge of the screen. Other on-screen information displays the routine being done, the section it's from, the number of the exercise itself, and a count of the repetitions remaining. Because of this, fitness fans can ascertain where they are instantaneously.

The video body buff is comprised of two sprites (upper and lower halves "joined" together at the waist). Besides producing a very limber figure, this setup also makes for some strange contortionist-like maneuvers never destined for duplication by a normal human being.

The unusual moves and on-screen petiteness of the instructor take some getting used to, though watching the routines before working out with them eliminates most problems associated with following her lead.

Assisting this look and learn phase is a joystick, plugged into port #2, which allows aerobicisers to scan the extensive routines quickly. During actual sessions pressing the firebutton permits skipping of unwanted sections. This makes it possible to take special care of trouble spots by designing a customized routine.

No doubt one of the best aspects of a regular aerobics class is the upbeat music that leads, encourages, and just plain enables most people to enjoy a workout they would otherwise avoid entirely. Likewise, one of the most impressive features of Spinnaker's Aerobics is the quality, variety, and originality of its musical score.

Good portions of the 64's extensive octave range, its three voice channels, and it's incredible harmony potential are utilized. Wait till you check out the snappy percussion pieces!

Despite the tremendous selection of routines (including warmup and cooldown), the exceptional graphics, and the superb audio effects, there is a problem which can't be overcome through familiarity.

This bugaboo, as it were, is the lengthy disk access time between routines. For an aerobics regimen to be most rewarding, the body must practically be in constant motion. Too long a wait between exercises (as here) only negates the positive aspects of a thorough workout.

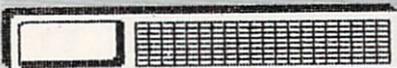
However, even the time problem can be overcome by extending the current routine (or substituting another) until the new section is loaded and underway. Just a little ingenuity is all it takes!

Also because of this inherent delay, the times listed for each level are somewhat inaccurate. Adding ten or fifteen minutes to each brings the times much closer to reality. Plan accordingly.

Aerobics (\$44.95 list, discounted to about \$36.00) is distributed by the Spinnaker Software Corporation, 215 First Street, Cambridge, Massachusetts 02142.

All right you slouches, keep your stomach tight, buttocks tucked, and feet parallel about hip-width apart. Then do twenty jumping jacks. Next, stretch it out. Can you feel the burn?

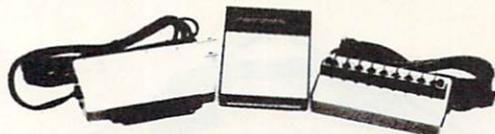
AEROBICS from:  
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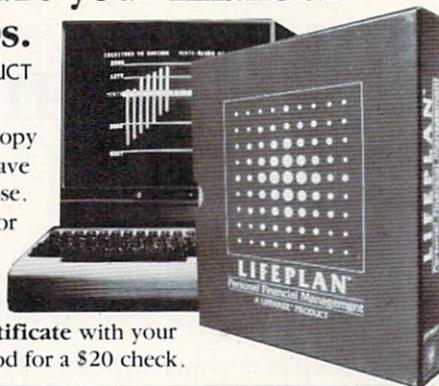
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- Mail to: LIFEWARE, 2318 Second Ave. #64A, Seattle, WA 98121. VISA/MC orders may call (206) 322-5454 to order direct. Please allow 2-6 weeks for shipping.

# Tel-Easy<sup>T.M.</sup>



## Terminal Software

Tel-Easy is an easy-to-use telecommunication software cartridge for your Commodore 64.

Tel-Easy is menu driven, and supports Auto-Dial modems. It also features a real time clock with alarm, 32K capture buffer, full sending and retrieving of information. Saves data as a program file or sequential file to the disk drive.

Tel-Easy terminal software opens the world of your Commodore 64 to telebanking and telelearning.

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Dealer Inquiries Welcomed



... Sonar reports the "whine" of torpedoes running toward you. You kick the destroyer's rudder full-right and order flank speed.

As you watch, two torpedoes cross your bow. Sonar returns quicken and you close on the submarine below. Suddenly, bearing to target shifts 180 degrees and the sonar return is instantaneous. THE SUB IS DIRECTLY BELOW! You stab the fire button and watch as 6 depth charges arch into your wake. Several long seconds pass before they explode, sending six domes of white water to the surface. The message "SUBMARINE SUNK" flashes on the screen. But congratulations are brief. Four more subs are lurking out there somewhere, trying to escape into the open ocean...

SONAR SEARCH is a "fast-action" strategy game based on anti-submarine warfare. You are the commander of a group of three destroyers sent to intercept a pack of 5 enemy submarines. Equipped with sonar gear and depth charges, and aided by submarine sightings from other ships and aircraft, you must get directly over a sub to score a hit with your depth charges.

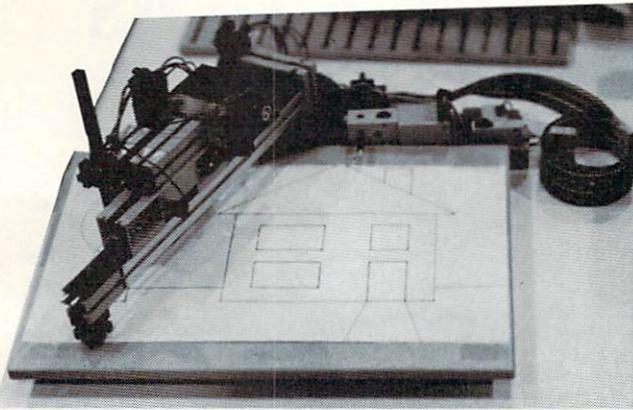
SONAR SEARCH makes full use of the high-resolution graphics, multicolor and audio capabilities of the Commodore 64. Programmed in machine language to provide immediate response to your commands, SONAR SEARCH is realistic, educational and entertaining. Comes complete with Instruction Manual and keyboard template.

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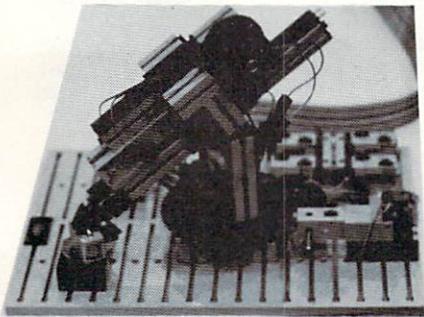
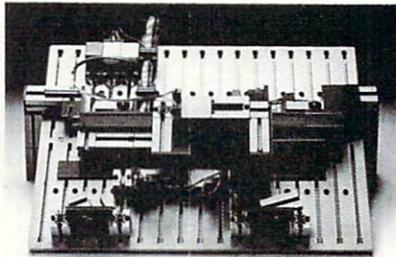
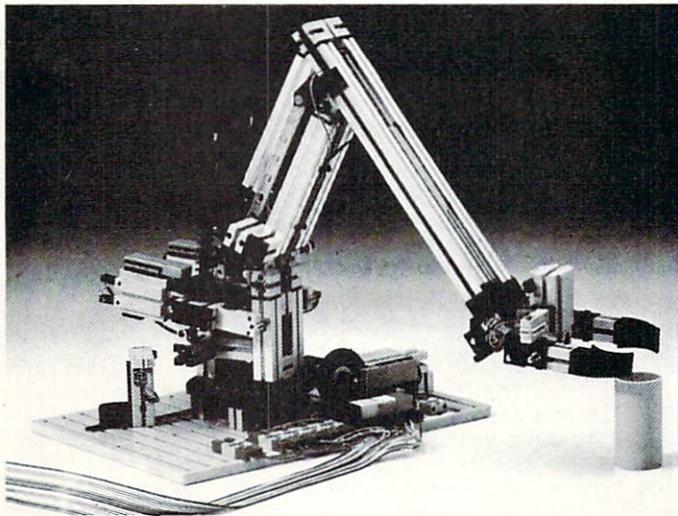
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# NEWS & VIEWS

## SPECIAL CES EDITION



PEN PLOTTER

MACHINE-TOOL  
SIMULATOR →← TEACHING  
ROBOT3-AXIS SEMI-PROFESSIONAL TRAINER  
(NOT PART OF KIT- DUE LATER '85)

## FISHERTECHNIK

My favorite third-party booth was FISHERTECHNIK. For about \$200 you can get a dynamite robotics kit with an interface, software and electro-mechanical parts box with super-quality motors, gears, and other goodies necessary to make precision working industrial-style robots. This is finest robotics product this reviewer has ever seen! FISHERTECHNIK is not a newcomer to robotics & computers; they supply elaborate robotics modeling systems to companies like FORD and IBM for studying manufacturing systems and plant-layouts.

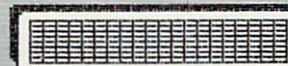
The new kit has well-illustrated plans (works of art themselves) and programs on diskette for constructing 10 great systems including: a flat-bed pen plotter / 'tower of Hanoi' part-sorting robot / solar-cell tracking robot (follows the light) / teaching robot (learns and repeats movement sequences) / graphic input digitizer / block-sorting system (sorts building blocks by length) / infinitely variable antenna rotor positioner / traffic light simulator / machine-tool simulator (co-ordinates two separate functions) / and a materials lift (moves to 3 different floors under computer control).

Of course you can design plenty of other projects using your own imagination and programs. You can also expand on the system with parts from other FISHERTECHNIK kits (I have had a FISHERTECHNIK 'erector-set' for many years, and I can testify to the outstanding precision and craftsmanship of their products).

A more elaborate 3-axis, semi-professional training robot arm with 1mm-accuracy within the work envelope is scheduled for later release.

We are eagerly awaiting our review unit, and will give a full report as soon as possible.

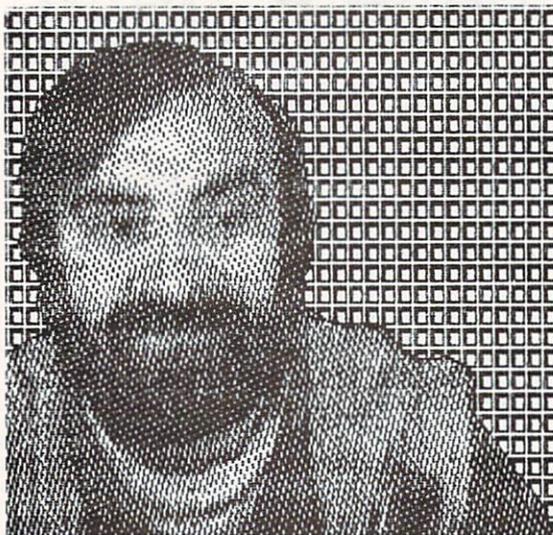
[ For more INFO, contact: FISHERTECHNIK / 175 Route #46 West / Fairfield, NJ 07006 / (201) 227-9283 ]



# NEWS & VIEWS

SPECIAL C.E.S. EDITION

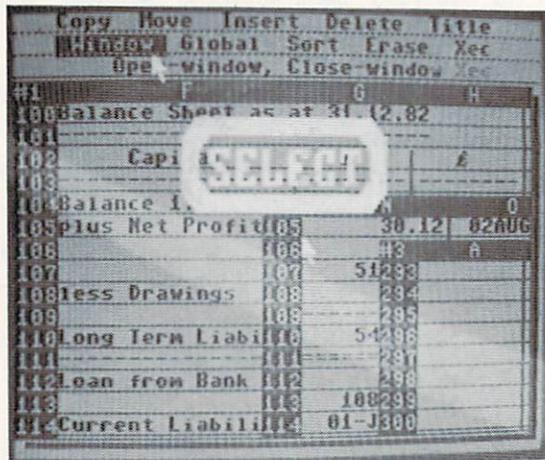
## VIDEO DIGITIZERS



I call this one:  
"self-portrait with waffle-iron"

The next most interesting set of products were the video digitizers. Two systems were being shown: one by **CARDCO**, and the other by **DIGITAL VISION**. Of the two, **DIGITAL VISION's** **COMPUTEREYES** is available immediately (in fact, we have been using one for about 2 months at **INFO-64** and all the digitized photos in this issue were produced with **COMPUTEREYES** in conjunction with **FLEXIDRAW** light pen software from **INKWELL SYSTEMS**). Both systems are around \$300 with a hi-res black and white camera included (shave off about \$150 if you have your own camera), both produce multiple grey-level images, and both interface the C-64 thru the cartridge port. **COMPUTEREYES** has software for use with most popular graphics software including **KOALA PAINTER**, **DOODLE**, & **FLEXIDRAW**. Thus images captured with the video camera may be manipulated extensively with your favorite graphics package (the background of my portrait here doesn't exist- it is a pattern fill from **FLEXIDRAW 5.0**). The **CARDCO** package is quite a bit faster at grabbing images, which can be important if you have a human subject sitting before you in real-time! Look for a side-by-side review of these two products in a future issue.

[ For more INFO, contact:  
**CARDCO** / 300 S. TOPEKA / WICHITA, KS 67202 / (316) 267-6525  
**DIGITAL VISION** / 14 OAK STREET - SUITE 2 / NEEDHAM, MA 02192 / (617)444-9040

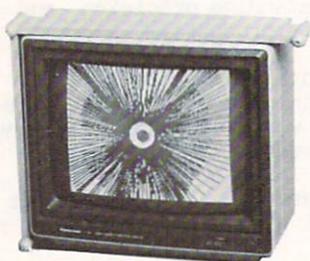


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101			
102	Capital		
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104	Balance f.		0
105	plus Net Profit	30.12	02AUG
106		43	A
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114	Current Liabilities	01-1300	

Solid State's "VIZASTAR"

## PRODUCTIVITY

Several new productivity packages were on display. Integrated packages were popular; like **TRIO** from Softsync, Inc. (word processing, spreadsheet, & file manager) & **HOMEPAK** from Batteries Included (word processing, file manager, terminal software). Cardco was showing **CALC-NOW**, an under \$40 spreadsheet with some hi-priced features. Perhaps the most interesting from both a product and human interest angle was **VIZASTAR**, an integrated spreadsheet and database manager. **VIZASTAR** is a nice package with some unusual features which we will be reviewing soon in detail (see photo left), but perhaps as interesting as the product, is the person behind it. If the name 'Jay Balakrishnan' doesn't ring a bell, maybe the name 'Human Engineered Software' (HES) does. Jay is the former key man behind the now defunct software giant of 1984, he is now the President of Solid State Software; **VIZASTAR** is his first (and so far as I know, only) product. At last year's CES, you couldn't get in to see Jay unless you were a V.I.P.- this year Jay was working from a card-table in an 8' X 8' booth with a stack of 2-color brochures. How times change.  
[Solid State Software / 1253 Corsica Lane / Foster City, CA / (415) 341-5606]



Soniture's "SpaceTablet"



# NEWS & VIEWS

SPECIAL CES EDITION



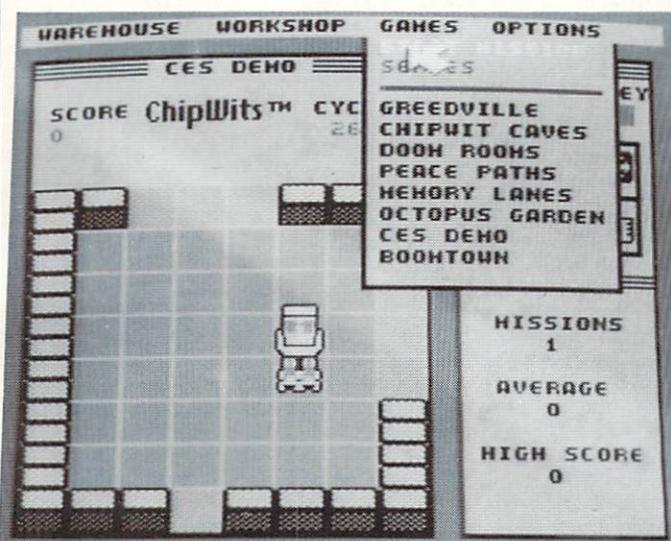
COVOX'S "VOICE MASTER"

## INPUT DEVICES

Pictured here are two very interesting input devices, also to be reviewed soon: **VOICE MASTER** by Covox inc., is a \$90 hardware/software system including speech synthesis, voice recognition, and a 'VOICE HARP' feature that takes singing or humming as input and turns it into written music which can be edited and played back! A truly amazing product! Also on the unusual side is **SPACE TABLET** from Soniture, Inc. **SPACE TABLET** is a sonic 3-D input device that handles like a light pen, but is tracked thru 3-D space by a sonic detector frame which is made to mount around your monitor. This rig allows not only X and Y coordinates to be input, but Z as well!

[Covox Inc. / 675-D Conger Street / Eugene OR / 503-342-1271 ]

[Soniture Inc. / 2146 Paragon Drive / San Jose, CA 95131 / 405-435-0217 ]



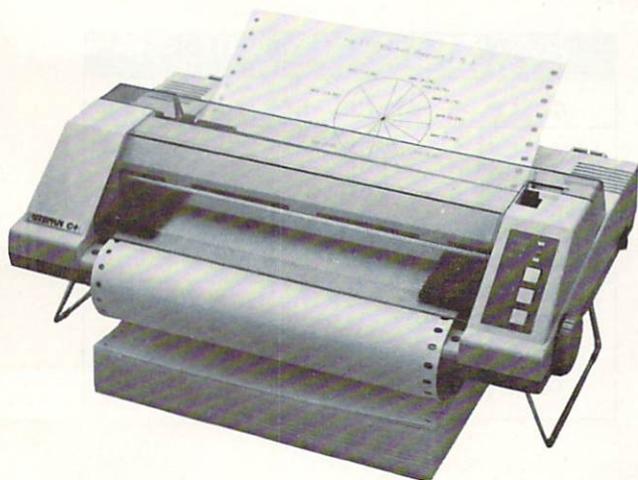
"ChipWits" from Epyx

## GAMES

Of course there were Games, Games, Games! Lots of old themes getting new names and packages. Some new trends seemed promising, however. **ChipWits** (Epyx, shown left) is a fascinating example of fresh thinking and top-notch execution. Pull-down menus, sharp graphics & animation, and a challenging, intelligent theme will probably put this one well up the best-seller list. Epyx also showed some 'name' software: **Ball Blazer** from Lucasfilms, as well as **G.I. Joe**, and **Barbie** games were running. Activision had a few more good looking titles (**COUNTDOWN TO SHUTDOWN** looked especially good), but also a few yawners like **WEB DIMENSION & MASTER OF THE LAMPS**- very dull stuff.

## PRINTERS

Get ready for a **tidal-wave** of new low-cost printers. Everybody has cut their prices, improved their performance, and come out with new models. Epson, C.Itoh, Inforunner, Okidata, Star Micronics; all have very competitive gear for your printing pleasure! The most original design I saw was Inforunner's **Riteman C+** which has built-in legs that make it it's own printer stand! The C+ is also ready to go with the C-64 and C-128 computers (no extra interface needed) and prints all the **Commodore** graphics characters etc. At \$299 list, with Epson code compatibility, it should do well. [ Inforunner Corp. / Airport Business Center / 431 N. Oak Street / Inglewood, CA 90302 ]



Inforunner Riteman C+



## PROTECTO AND THE - SUPER SYSTEM -

You've all seen the PROTECTO ads (8 to 16 page black & white spreads in every other magazine even remotely related to computers). Something about the style of the ads has always made me wary, but I found myself needing a monitor, and \$69 was the price I wanted to pay.

I was totally unprepared for the genuinely friendly voice that took my order. My monitor arrived 2 days later by UPS, appeared brand new, and to this day is working like a champ. Encouraged by this modest but pleasant experience, I took the big plunge and ordered the "too good to be true" Super System (\$795 gets you a CBM B-128 computer, an 8050 dual drive, a 12" green monitor, a CBM printer, cables, paper, 10 diskettes, and manuals !!!) All I really wanted was the 8050 drive, but it cost more alone elsewhere. Again, some (different) intelligent & agreeable person took my order, the equipment arrived, and everything worked fine (well almost). I discovered that drive #1 wouldn't format properly on the 8050. I thought I had discovered the explanation for the low, low prices. I called them immediately, ready to threaten INFO=64's wrath if they thought they could get away with this! I never got the chance- a third phone answer (who sounded like she would rather hear my complaint than take a free vacation to the Bahamas) cheerfully said to send the unit back for immediate (and it was) replacement!

I couldn't stand it! These people were so nice, the bargains so terrific, there had to be a catch! I called the Vice President, Bill Badger, and demanded an explanation! Even tho it was 5pm on a Friday, Bill seemed glad explain that basically PROTECTO hunts down good deals from manufacturers and makes good deals for the public (while this often means discontinued or surplus products, you can't beat the prices and you get a 15 day free trial and a 90 day warranty.) As far as the nice people on the phone: Bill said that they really emphasize the human relations aspect of the business, and that people that can't measure up, are quickly found other types of work.

Well, I learned my lesson, and INFO=64 is now looking forward to a 2nd Super System to upgrade our operation. Is this a deal for you? It depends: the 8050 can be used with your C-64 with any of the IEEE adapters, it is fast and stores lots of data. It can't load commercial disks formatted for the 1541- you must still use your 1541 etc. to load commercial programs (tho any copyable programs can be saved to and then re-loaded from the 8050.) The B-128 is incompatible with the C-64 software, but PROTECTO offers several titles written for it including: Superbase, Easy Script, Calc-Result, and the Info Designs Accounting series. Also, PROTECTO will put you in touch with a B-128 users group that can help you get more out of your B-128. If you are interested, don't wait! Bill says the B-128s are selling out at a record rate.

[ Protecto Enterprises / Box 550 / Barrington, IL 6010 / 312 382 5244 ]

## 3 HARD DRIVES

It looks like Commodore computing is about to grow up real fast- first we have the new machines from Commodore, and now there are, not 1, not 2, but 3 hard disk drives about to hit the shelves for all of us storage-hungry data-mongers!

First we have the Lt. Kernel drives from Fiscal Information ranging from 10 Meg (\$1300) to 80 Meg (!! \$\$\$?) (see Don Vandeventer's article beginning on pg. 22 for more on these).

Then there is another 10 Meg drive from Computer Specialties, Inc. (CSI) called the CSI ST10C. It should be ready for shipment in May, and lists for \$1595. It features serial or IEEE connection, built-in backup software, reformat protection, external device selection, a 90 day warranty. [CSI / PO Box 1718 / Melbourne, FL 32902 / 305-725-6574 ]

Last, but definitely not least, is Micro Mind's GENESIS (you saw it here first, folks!), a new 25 Megabyte half-height Winchester drive that will retail for an amazing \$1200! Bob Burton, President of Micro Mind, says the Pittsfield, MA based company will be packaging their own custom controller boards and software with the half-height drives made by MiniScribe. First shipments are scheduled for May 1 of this year. INFO=64 will be testing one of the first available units, and we'll give you a full report as soon as Issue #7. If all goes well, we will be maintaining our growing subscription list on this baby (and it comes none too soon!). Billing GENESIS as "A new beginning for the C-64", MICRO MIND is also readying a special version that will actually fit in the second drive-bay of the SX-64!! Since these have been discontinued by Commodore, it might be a good time to go get one at K-Mart if you are interested in transportable super-powered 64 computing!

[ Write: Micro Mind / 104 Hawthorne Ave. / Pittsfield, MA 01201 ]

### The cost for a Megabyte of disk storage capacity:

drive	price	CAP(K)	\$/MEG
CBM 1541	\$ 250	170	\$1470
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Genesis	\$1200	25000	\$ 48

\*(Protecto's total price for system including CBM B-128, computer, monitor, & printer. thus actual \$/MEG is closer to \$495)



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Blue Max	21	IFR Flight Simulator	23	Spelunker	23	Zaxxon	29
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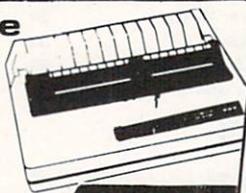
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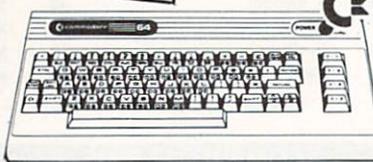


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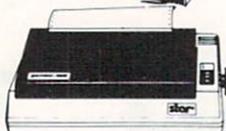
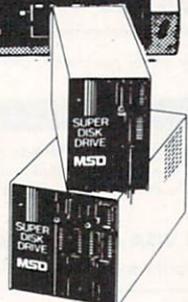
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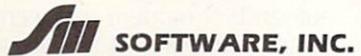
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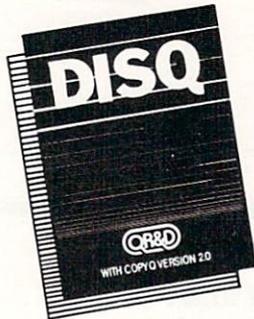
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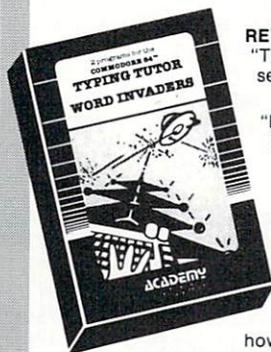
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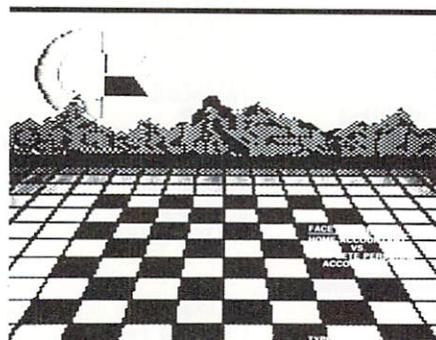
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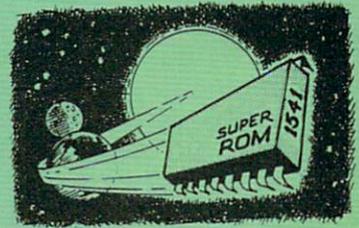
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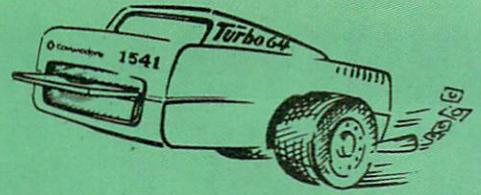
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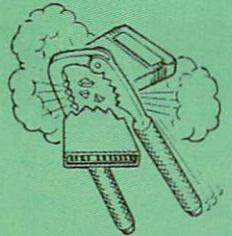


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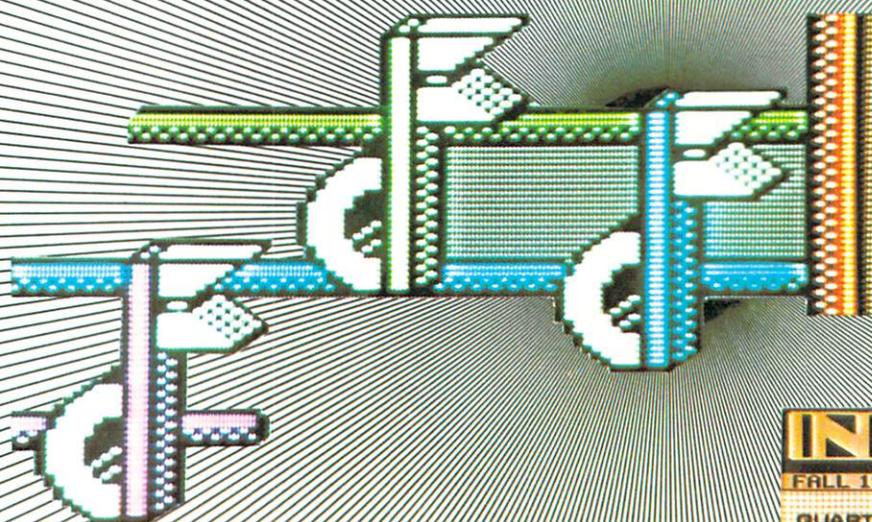
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